Vol. 932 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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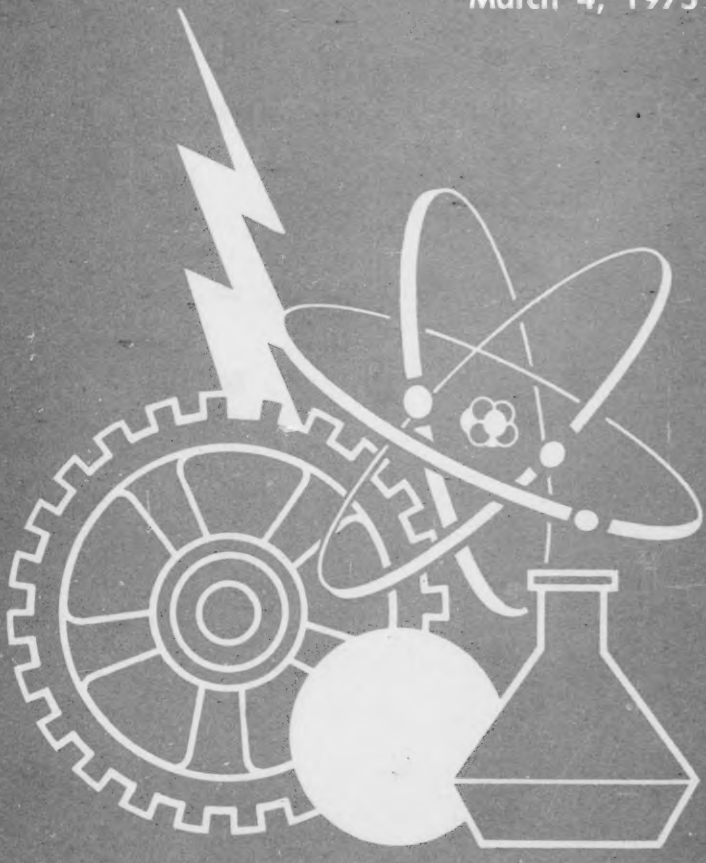
PATENTS

March 4, 1975



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PATENT AND TRADEMARK OFFICE NOTICES

Conference of Parties in Trademark Inter Partes Proceedings

Under the inter partes rules of procedure in trademark cases effective July 1, 1972 (898 O.G. TM 170, May 16, 1972), the interlocutory phases of trademark inter partes proceedings are becoming increasingly involved, and the experience of the Trademark Trial and Appeal Board has been that the difficulties in such proceedings can frequently be resolved more satisfactorily and quickly by conference in person than by correspondence or telephone. Therefore, effective immediately, the following practice is being adopted:

> Whenever it appears to the Trademark Trial and Appeal Board that questions or issued arising during the interlocutory phase of a trademark inter partes proceeding have become so complex that their resolution by correspondence or telephone is not practical and would be likely to be facilitated by conference in person of the parties and/or their attorneys with a member or members of the Trademark Trial and Appeal Board, the Board may at its discretion suggest that the parties and/or their attorneys, under circumstances which will not result in undue hardship for any party, meet with the Board at its offices in Crystal Plaza, Arlington, Virginia, to discuss the resolution of difficulties.

C. MARSHALL DANN,
Feb. 3, 1975. *Commissioner of Patents and Trademarks.*

PATENT AND TRADEMARK OFFICE

Board of Appeals

Present Vacancies To Be Filled by Appointment Under the Classified Civil Service

Notice is hereby given that, pursuant to the amendment of sections 3 and 7 of title 35, United States Code, by Public Law 93–601 (88 Stat. 1956), effective January 2, 1975, examiners-in-chief will no longer be appointed by the President, by and with the consent of the Senate, to serve on the Board of Appeals of the Patent and Trademark Office. In accordance with the provisions of section 7, as amended by Public Law 93–601, present (and future) vacancies on the Board of Appeals will be filled by appointment of examiners-in-chief under the classified civil service. These appointments will be made at a salary in the range from $34,607 to $36,000 per annum.

Persons interested in being considered for these vacancies are invited to submit their applications to the address given below, or on or before March 21, 1975. The duties, qualifications, and factors which will be considered in evaluating the candidates are described below.

Duties: Serves as a member of the Board of Appeals of the Patent and Trademark Office. As an Examiner-in-Chief, Participates in its appellate and administrative responsibilities and exercises independent judgment on all matters before him on appeal subject to administrative and policy direction of the Commissioner. Appeals filed in accordance with 35 U.S.C. 134 and Rules 191 through 198 of the Rules of Practice of the United States Patent and Trademark Office in Patent Cases involve complex legal and technical questions. The Board of Appeals has the sole power to hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents and for reissue of patents. Final decisions of the Board, if unfavorable to an applicant, may be appealed to the United States Court of Customs and Patent Appeals or civil action may be taken in accordance with 35 U.S.C. 145.

Qualifications: Candidates must possess (1) a minimum of five years of patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of full signatory authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office; (2) a law degree or be a member in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the constitution; (3) a high degree of demonstrated competence in chemistry, engineering, physics or other major scientific discipline; (4) ability to write clearly and logically; (5) comprehensive experience in patent prosecution. examination or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

Factors Which Will Be Considered in Evaluating the Candidates: Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals of past performance and potential. *Note*: The qualifications of the proposed incumbent will have to be reviewed and approved by the Department of Commerce and by the U.S. Civil Service Commission before an appointment can be made effective.

Employees of the Department of Commerce may apply by submitting a completed Merit Promotion Interest Statement, Form CD 261, and a completed SF 171, Personal Qualifications Statement, if one is not already on file at the address given below. Persons who are not employees of the Department of Commerce should submit only a completed SF 171. Copies of Form SF 171 may be obtained at local post offices. The completed forms should be sent to:

U.S. Patent and Trademark Office
Office of Personnel
Building 2, Room 9C05
Crystal Plaza
Arlington, Virginia 22202

Questions concerning this notice should be directed to Ms. Margaret M. Mazza, Office of Personnel, Room 2-9C05, Telephone (703) 557–3631.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.
February, 1975.

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

Name Change

Pursuant to authority contained in 35 U.S.C. 6, as amended (85 Stat. 364), Chapter I of Title 37 of the Code of Federal Regulations is amended as follows:

The heading of Chapter I is changed to read as set forth above.

Wherever the name "Patent Office," and the title "Commissioner of Patents," appear in Chapter I, they are changed to read, respectively, "Patent and Trademark Office" and "Commissioner of Patents and Trademarks."

Public law 93–596, 88 Stat. 1949, changed the name of the Patent Office to "Patent and Trademark Office," and the title of the Commissioner of Patents to "Commissioner of Patents and Trademarks."

It is the general policy of the Patent and Trademark Office to afford interested members of the public an opportunity to participate in the rulemaking process. However this amendment is entirely editorial in nature. Therefore, the public rulemaking procedure is waived and this amendment will become effective on February 4, 1975.

C. MARSHALL DANN,
Commissioner of Patents.

Approved:
BETSY ANKER JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 75–3135; Filed 2–3–75; 8:45 am]

Published in 40 F.R. 5158, Feb. 4, 1975

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,445,322, M. C. Fridolph, BODY GARMENT; **2,707,280,** E. G. Mayer, GIRDLES, **filed** Nov. 16, 1962, D.C., S.D.N.Y., Doc. 62–C–3797, *Sarong Inc.* v. *Lido Foundations Inc.* Filed stipulation and order of dismissal, Oct. 31, 1967.

2,707,280. (See 2,445,322.)

2,813,341, A. Di Mino, MULTIPLE PATTERN GRADER; **2,972,188,** W. Kaufman, MAKING GRADED PATTERNS FOR GARMENTS; **3,085,340,** A. Rashbaum, GRADING MACHINE, **filed** Nov. 1, 1967, D.C., S.D.N.Y., Doc. 67–C–4262, *William Kaufman, doing business as Precision Pattern* v. *Chevette Lingerie Inc., Stacy Ames, Inc., and Simplicity Pattern Co. Inc.* Filed order discontinuing action without cost, Apr. 18, 1973.

2,860,836, H. Jordan, MOUNTING SLEEVE AND CLAMP MEANS FOR DISPOSED DEVICES; **2,879,949,** same, GARBAGE DISPOSAL APPARATUS; **2,945,635,** same, RESILIENT HANGING DEVICE FOR WASTE DISPOSAL APPARATUS; **2,965,318,** same, WASTE DISPOSAL DEVICE HAVING NOISE DAMPING MEANS; **3,076,611,** same, GARBAGE DISPOSAL DEVICE, **filed** Feb. 4, 1974, D.C., C.D. Calif. (Los ANGELES), Doc. 74–293–DWW, *Waste King Corp.* v. *The Maytag Co., Inc.* Filed judgment and order thereon that plaintiff is the licensee of 2,860,836, 2,879,949 and 2,945,635 in suit and is the sole owner of 2,965,318 and 3,076,611. Defendant has infringed one or more of the claims of each said patent, entered Oct. 8, 1974.

2,879,949. (See 2,860,836.)

2,945,635. (See 2,860,836.)

2,965,318. (See 2,860,836.)

2,972,188. (See 2,813,341.)

3,076,611. (See 2,860,836.)

3,082,292, R. W. Gore, MULTICONDUCTOR WIRING STRIP; **3,540,956,** Arnold and Gore, PRECISE CONDUCTOR CABLES, **filed** June 17, 1971, D.C. Del. (Wilmington), Doc. 4160, *W. L. Gore & Associates, Inc.* v. *Carlisle Corporation.* Judgment by order, Patent 3,540,956 is invalid. Patent 3,082,292 is valid and that claims 1–14 and 24–27 of said patent are infringed by the defendant, therefore the defendant is enjoined from infringing the plaintiff's patent, Oct. 11, 1974.

3,085,340. (See 2,813,341.)

3,153,435, H. C. Ober, SHREDDER AND CHOPPER, **filed** Oct. 3, 1974, D.C., N.D. Ohio (Cleveland), Doc. C–74–895, *Howard C. Ober* v. *Gravely-Ohio Co.*

3,232,761(a), Allen and Burness, HARDENING OF PHOTOGRAPHIC GELATIN LAYERS; **Re. 26,601,** same, **filed** July 16, 1974, D.C. Del. (Wilmington), Doc. 74–147, *Eastman Kodak Company* v. *GAF Corporation.*

3,232,761(b), Allen and Burness, HARDENING OF PHOTOGRAPHIC GELATIN LAYERS, **filed** July 16, 1968, D.C.N.J. (Newark), Doc. 729–68, *Philip A. Hunt Chemical Corporation* v. *Eastman Kodak Company.* Stipulation and order of dismissal of action, July 16, 1974.

3,238,551, Cirino and Brenner, CAR WASHING APPARATUS; **3,271,803,** same, VEHICLE WASHING APPARATUS, **filed** Jan. 26, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–155–HP, *Little Darling Corporation* v. *California Car Wash Systems.* Filed plaintiff's dismissal with prejudice of the action, the complaint and the first amended complaint as to defendant. Filed defendant's dismissal with prejudice of its counterclaim an order thereon, entered Oct. 17, 1974.

3,271,803. (See 3,238,551.)

3,293,405, R. J. Costanzo, ELECTRICALLY HEATED FOOTWEAR, **filed** Mar. 16, 1967, D.C. Conn. (New Haven), Doc. 11864, *Timely Products Corporation and Raphael J. Costanzo* v. *Stanley Arron, Patricia Sulzyski, Barbara Chervenak and Visa-Therm Products, Inc.* Judgment entered in favor of defendants, declaring Patents 3,293,405, 3,392,264 and 3,524,965 invalid, Sept. 9, 1974.

3,351,118, M. E. Ward, MEANS FOR SUPPLYING AIR TO A GAS BURNER; **3,391,982,** same, GAS BURNER, **filed** Oct. 25, 1974, D.C. (District of Columbia), Doc. 74–1561, *Andro Corporation* v. *Weil McLain Co. Inc.*

3,389,814, J. H. Lemelson, LOAD RESPONSIVE CONTROL MEANS FOR A MATERIAL HANDLING APPARATUS; **3,402,835,** S. Saul, CONTROL SYSTEM FOR A ZONED AUTOMATIC WAREHOUSE ARRANGEMENT; **3,486,640,** J. H. Lemelson, MULTI-SPEED CONTROL SYSTEM FOR A LOAD CARRIER IN A WAREHOUSE SYSTEM, **filed** July 30, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2157, *The Triax Company* v. *Conco, Inc.*

3,391,982. (See 3,351,118.)

3,402,835. (See 3,389,814.)

3,426,952, Chew and Toth, ARC WELDER HAVING BUILT-IN SHEAR FOR JOINING STRIP; **3,489,520,** Chartouni and Dawe, TITRATION RECORDING APPARATUS, **filed** Mar. 22, 1974, D.C., N.D. Ill. (Chicago), Doc.74c831, *Sargent-Welch Scientific Company* v. *Beckman Instruments, Inc.* Final judgment on consent, plaintiff is owner of patents. Patents are valid. Beckman has infringed patents and is permanently enjoined from further infringement. All counts of Beckman's counterclaim are dismissed with prejudice, Oct. 11, 1974.

3,440,525, C. P. Cardeiro, PH METER AND CONTROL SYSTEM, **filed** Aug. 28, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2212, *Universal Interloc, Inc.* v. *Leeds & Northrup Company.* Dismissal order, ordered complaint and counterclaim are dismissed without prejudice, Oct. 11, 1974.

3,478,700, Lundvall, Loomis and Breen, FLOOR LATCH STRIP FOR RAILWAY CARS; **3,570,416,** J. A. Shook, FREIGHT-BRACING APPARATUS, **filed** Oct. 4, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2492, *Unarco Industries, Inc.* v. *Evans Products Company et al.* Action dismissed without prejudice, Nov. 2, 1973.

3,486,640. (See 3,389,814.)

3,489,520. (See 3,426,952.)

3,499,481, W. C. Avrea, PRESSURIZED LIQUID COOLING SYSTEM; **3,601,181,** same, METHOD AND APPARATUS FOR PURGING AIR FROM INTERNAL COMBUSTION ENGINE COOLING SYSTEMS, **filed** Feb. 14, 1972, D.C. Ariz. (Phoenix), Doc. C–70–455 Phx, *Saf-Gard Products, Inc.* v. *Service Parts, Inc. et al.*

3,510,162, Smith and Binns, SELF-ADJUSTING LOCK; **3,642,314,** same, GRAVITY-ACTUATED LOCK, **filed** Aug. 8, 1974, D.C., E.D. Tex. (Tyler), Doc. TX–74–96–CA, *Overhead Door Corporation* v. *Newcourt, Inc.*

3,540,956. (See 3,082,292.)

3,570,416. (See 3,478,700.)

3,585,277, P. E. Lewis, MIDSPAN ELECTRICAL CONDUCTOR SPACER, **filed** Oct. 18, 1974, D.C., N.D. Ala. (Birmingham), Doc. CA 74–G–1097–S, *A. B. Chance Company* v. *Continental Electric Company.*

3,601,181. (See 3,499,481.)

3,642,314. (See 3,510,162.)

3,706,156, E. L. Thornell, MUSICAL WRISTWATCH TOY; **D. 224,661,** HOUSING FOR A TOY MUSIC BOX, **filed** Aug. 7, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2233, *Marlin Toy Products, Inc.* v. *Sears, Roebuck and Co. et al.*

3,729,824, Baues, Marini and McCauley, ORTHODONTIC ARCH WIRE, **filed** Oct. 17, 1974, D.C., S.D. Calif. (San Diego), Doc. 74–490–T, *G.A.C. International, Inc.* v. *Lancer Pacific Incorporated.*

3,750,722, R. L. Nowak, FUNNEL, **filed** Oct. 21, 1974, D.C. Del. (Wilmington), Doc. 74–217, *Funnelcap Inc.* v. *Orion Industries, Inc. and Corporation Trust Company.*

Re. 24,992, E. E. Ellies, METHOD OF TREATING FRESH MEATS, **filed** Apr. 28, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71–446, *St. Regis Paper Company* v. *Tee-Pak.* Stipulation and order settling and dismissing case with prejudice, Oct. 23, 1974.

Re. 26,601. (See 3,232,761(a).)

D. 224,661. (See 3,706,156.)

D. 232,075, H. Cooper, BOTTLE, **filed** Oct. 10, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2928, *Dog n Suds, Inc.* v. *Howard Cooper.*

Certificates of Correction for the Week of Mar. 4, 1975

Re. 28,291	3,833,234	3,848,159	3,854,779
3,282,492	3,833,736	3,848,181	3,854,785
3,672,327	3,835,097	3,848,232	3,855,138
3,701,753	3,835,240	3,848,251	3,855,277
3,714,215	3,835,632	3,848,323	3,855,343
3,714,234	3,836,734	3,849,083	3,855,363
3,721,242	3,836,799	3,849,371	3,855,440
3,726,644	3,836,975	3,849,425	3,855,460
3,728,459	3,838,221	3,849,427	3,855,513
3,732,298	3,838,474	3,849,518	3,855,696
3,736,084	3,838,774	3,849,603	3,855,817
3,751,287	3,838,799	3,850,073	3,855,895
3,759,788	3,839,856	3,850,147	3,856,128
3,770,928	3,840,299	3,850,392	3,856,426
3,778,280	3,840,401	3,850,570	3,856,427
3,782,760	3,840,517	3,850,719	3,856,456
3,786,260	3,840,602	3,850,735	3,856,516
3,790,966	3,840,673	3,850,760	3,856,591
3,791,778	3,841,130	3,851,070	3,856,665
3,798,515	3,841,595	3,851,225	3,856,922
3,801,672	3,841,602	3,851,239	3,856,940
3,803,176	3,842,174	3,851,240	3,857,151
3,804,303	3,842,438	3,851,273	3,857,165
3,804,861	3,842,811	3,851,472	3,857,230
3,809,571	3,842,884	3,851,766	3,857,313
3,810,867	3,843,773	3,851,863	3,857,434
3,810,874	3,843,931	3,852,229	3,857,510
3,810,890	3,844,052	3,852,371	3,857,758
3,812,205	3,844,641	3,852,438	3,857,819
3,813,067	3,844,994	3,852,509	3,857,900
3,814,682	3,845,146	3,852,532	3,858,022
3,817,952	3,845,562	3,852,986	3,858,084
3,820,711	3,845,572	3,853,152	3,858,170
3,822,459	3,845,585	3,853,185	3,858,226
3,822,863	3,845,878	3,853,271	3,858,390
3,823,589	3,846,180	3,853,356	3,858,435
3,826,163	3,846,400	3,853,532	3,858,633
3,827,089	3,846,638	3,853,540	3,858,658
3,827,207	3,846,957	3,853,753	3,859,113
3,828,764	3,847,167	3,853,924	3,859,137
3,829,392	3,847,186	3,853,939	3,859,197
3,829,559	3,847,453	3,854,153	3,859,261
3,830,295	3,847,607	3,854,319	3,859,610
3,830,390	3,847,750	3,854,424	3,859,627
3,832,035	3,847,869	3,854,618	3,859,665

Errata

All reference to Patent Number 3,854,857 to Stefan Fischer et al. for Mold Opening and Closing Device for an Apparatus Making Hollow Bodies from Thermoplastic Material, appearing in the OFFICIAL GAZETTE of Dec. 17, 1974, should be deleted since no patent should have been granted.

All reference to Patent Number 3,863,768 to Melvin Cohen of Wayne, N.J. for Magazine Rack, appearing in the OFFICIAL GAZETTE of Feb. 4, 1975, should be deleted since no patent was granted.

Patents Available for Licensing or Sale

D. 219,350. BREAD TRAY. Howard L. Rivenburk, P.O. Box 22, Teachey, N.C., 28464.

2,995,619. SYSTEM OF TELEVISION TRANSMISSION AND PHOTOGRAPHIC REPRODUCTION OF THE TELEVISED IMAGE. Samuel Freeman, 13 Birchwood Court E., Syosset, N.Y., 11791.

3,270,920. APPARATUS FOR PRESSURE DISPENSING LIQUIDS. Charles G. Nessler, Correspondence to: Lawrence A. Cavanaugh, 155 Talcottville Rd., P.O. Box 2033, Vernon, Conn., 06066.

3,729,879. STICK ON INSULATORS. Andrew T. Franklin, P.O. Box 58, Togiak, Alaska, 99678.

3,739,905. CONNECTION DEVICE FOR CONTAINERS AND THE LIKE. Correspondence to: John F. McNulty, Paul & Paul, 1800 Land Title Bldg., Philadelphia, Pa., 19110.

3,743,227. LADDER SUPPORTED HOIST. Jack S. Sowery, 927 W. Main St., Troy, Ohio, 45373.

3,753,303. APPARATUS FOR HYDRAULICALLY RAISING ORE AND OTHER MATERIALS. Klein, Schanzlin & Becker Aktiengesellschaft, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,774,193. WATCHMAN'S TOUR ALARM SYSTEM. Tulio Vasquez Restrepo, Carrera 43A No. 30–91, Medellin, Colombia.

3,801,338. CEMENT ADDITIVES. Granville Whitaker, Correspondence to: Caesar, Rivise et al., Suite 804, Stephen Girard Bldg., 21 S. 12th St., Philadelphia, Pa. 19107.

3,807,672. KITE-FLYING CONTROL REEL. Dale E. Williams, 221 Crescent, Pasadena, Tex., 77506.

3,829,824. CLAMP BOLT FOR AN AUTOMOTIVE VEHICLE BATTERY. Edward L. Phillischafske, P.O. Box 965, Henderson, Nev., 89015.

3,832,743. BED SHEETS. Saundra L. Smith, Correspondence to: Cantor & Kraft, 2401 15th St., NW., Washington, D.C., 20009.

3,838,706. CONDUIT CLOSURE. Adam & Helmut Klenk, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,843,178. OVER HEAD HAND OPERATED DOOR LOCK. Alexander Eskoff, 4214 Euclid Ave., East Chicago, Ind., 46312.

3,842,522. METHOD FOR HYDRAULICALLY RAISING ORE AND OTHER MATERIALS. Klein, Schanzlin & Becker Aktiengesellschaft, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,851,429. DEVICE FOR ATTACHING A LATERAL CLADDING MOLDING ON THE EDGE OF A ROOF. Correspondence to: Holman & Stern, 2401 15th St., NW., Washington, D.C., 20009.

3,852,945. MOWER ATTACHMENT FOR GRADER BLADE. Ray J. Berry, 524 N. 33rd St., and Lonzo J. Simons, 2820 Morrow St., both of Waco, Tex., 76707.

3,857,537. HOLDER FOR PAINT PAIL AND APPLICATOR. Joseph E. Swalinkavich, Jr., 3440 Kyle Ave., N. Robbinsdale, Minn., 55422.

3,861,105. HANGARS FOR SUSPENDED CEILING STRUCTURES. Charles V. Starks, 3217 18th Ave., Rock Island, Ill., 61201.

The following 2 patents are offered by: Betty Lasiter, % Bradshaw & Albright, 1003 Plaza Blvd., Suite 229, National City, Calif., 92050.

3,391,778. VEHICLE UNLOADER.

3,563,342. STOWABLE TRUCK LADDER.

The following 2 patents are offered by: John O. Richards, 980 Mill Circle, Apt. 99, Alliance, Ohio, 44601.

3,578,840. REVOLVING REFLECTOR.

3,835,507. ROPE HOLDING DEVICE.

The following 5 patents have been issued on inventions resulting from the Inter-Industry Emission Control Program (also known as IIEC) and are available for licensing (non-exclusive) on reasonable terms for the purpose of reducing automotive pollution.

Inquiries regarding the availability of such licenses under the following patent may be addressed to: Ford Motor Company, The American Road, Dearborn, Mich., 48121, Attn.: W. D. Compton.

3,630,021. INTERNAL COMBUSTION ENGINE INCLUDING MEANS FOR REDUCING EMISSIONS.

Inquiries regarding the availability of such licenses under the following 2 patents may be addressed to: Nissan Motor Co., Ltd., 17–1, 6-chome, Ginza, Chuo-ku, Tokyo, Japan.

3,670,496. VEHICULAR AIR POLLUTANT REDUCING DEVICE HAVING A BYPASS MECHANISM.

3,673,993. AIR POLLUTION PREVENTIVE SYSTEM FOR MOTOR VEHICLES.

Inquiries regarding the availability of such licenses under the following 2 patents may be addressed to: Mobil Oil Corporation, 150 E. 42nd St., New York, N.Y., 10017.

3,885,388. METHOD OF PREPARING OXIDATION CATALYST FOR PARTIALLY COMBUSTED GASES.

3,861,143. HIGH TEMPERATURE PROTECTIONAL APPARATUS FOR ENGINE EMISSION CATALYTIC CONVERTER.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 39 patents.

Inquiries respecting licenses under these patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

Re. 28,285. ARTICLE LABELING AND IDENTIFICATION SYSTEM.

3,851,948. HOLOGRAPHIC THERMOPLASTIC MEMORY SYSTEM.

3,852,105. FABRICATION OF DARK HEATERS.

3,852,664. MAGNETIC REED SENSOR SUITABLE FOR USE IN IGNITION TIMING SYSTEMS.

3,852,679. CURRENT MIRROR AMPLIFIERS.

3,852,680. AMPLIFIER USING A NEGATIVE RESISTANCE SEMICONDUCTIVE DEVICE OPERATIVE IN THE ANOMALOUS MODE.

3,852,761. LENS FED ANTENNA ARRAY SYSTEM.

3,852,771. ELECTRON BEAM RECORDING PROCESS.

3,852,808. COLOR AMPLITUDE CORRECTION IN PLURAL TRANSDUCER SIGNAL PLAYBACK SYSTEMS.

3,852,818. TAPE CARTRIDGE PLAYER MECHANISM.

3,853,391. FABRICATION OF LIQUID CRYSTAL DEVICES.

3,854,006. SWITCHABLE VIDEO AMPLIFIER.

3,854,905. STORAGE SYSTEM FOR TWO PHASE FLUIDS.

3,854,992. PROCESS FOR DEPOSITING ELECTRICALLY CONDUCTIVE INDIUM OXIDE COATINGS ON A SUBSTRATE.

3,855,419. PWM MULTIPLEX SYSTEM.

3,855,497. DUAL BIAS CONTROLLED STORAGE TUBES.

3,855,535. PROGRAMMING SYSTEM FOR A MOTOR-DRIVEN TELEVISION RECEIVER TUNING APPARATUS.

3,855,540. PUSH-PULL TRANSISTOR AMPLIFIER WITH DRIVER CIRCUITS PROVIDING OVER-CURRENT PROTECTION.

3,855,541. CURRENT PROPORTIONING CIRCUIT.

3,855,549. CIRCUIT, SUCH AS CMOS CRYSTAL OSCILLATOR, WITH REDUCED POWER CONSUMPTION.

3,855,550. TRANSISTOR OSCILLATOR WITH DIODE IN FEEDBACK CIRCUIT PROVIDING AMPLITUDE STABILIZATION.

3,855,562. CIRCUIT BREAKER WITH AMBIENT TEMPERATURE COMPENSATION.

3,855,605. CARRIER INJECTED AVALANCHE DEVICE.

3,855,607. SEMICONDUCTOR INJECTION LASER WITH REDUCED DIVERGENCE OF EMITTED BEAM.

3,855,611. THYRISTOR DEVICES.

3,855,613. SOLID STATE SWITCH USING AN IMPROVED JUNCTION FIELD EFFECT TRANSISTOR.

3,856,565. METHOD OF ELECTROLESSLY PLATING A METAL TO A BODY WHICH INCLUDES LEAD.

3,856,591. METHOD FOR MAKING BEAM LEAD DEVICE.

3,856,989. SENSORS HAVING CHARGE TRANSFER RECYCLING MEANS.

3,857,047. DETECTOR EMPLOYING A CURRENT MIRROR.

3,857,058. ELECTRODE SUPPORT STRAP.

3,857,105. CASCADE AMPLIFIER USING COMPLEMENTARY CONDUCTIVITY TRANSISTORS.

3,857,113. MICROWAVE ACOUSTIC DELAY LINE.

3,857,526. REEL MOUNTING APPARATUS.

3,857,733. METHOD OF ELECTROLESS METAL DEPOSITION.

3,858,036. SQUARE ROOT OF SUM OF SQUARES APPROXIMATOR.

3,858,138. TUNEABLE THIN FILM INDUCTOR.

3,858,198. FIXED FORMAT VIDEO DATA DISPLAY EMPLOYING CROSSED-LINE PATTERN FORMAT DELINEATION.

3,858,239. COLOR ENCODED HOLOGRAM PLAYBACK APPARATUS.

General Electric Company is prepared to grant non-exclusive licenses under the following 48 patents upon reasonable terms to domestic manufacturers.

Applications for licenses under the following 3 patents may be addressed to: General Electric Co., Appliance Components Business Division, 1635 Broadway, Fort Wayne, Ind., 46804. Attn: Patent Counsel.

3,804,793. MAKING POLYAMIDE-ACID AQUEOUS DISPERSIONS FOR ELECTROCOATING.

3,809,862. OVEN TEMPERATURE CONTROL.

3,855,509. CONTROL SYSTEM FOR INDUCTION MOTORS.

Applications for licenses under the following 6 patents may be addressed to: Patent Counsel, STG-PRODS Division, General Electric Company, 1 River Road, Bldg. No. 43, Schenectady, N.Y., 12345.

3,813,898. HIGH TORQUE CRYOGENIC COUPLING.

3,826,969. HIGHLY STABLE PRECISION VOLTAGE SOURCE.

3,826,983. DIGITALLY SCALED DIGITAL VOLTMETER.

3,831,050. ROTOR FOR A DYNAMOELECTRIC MACHINE.

3,835,650. STEAM AIR PREHEATER FOR A STEAM BOILER SYSTEM.

3,846,739. TWO-OUT-OF-THREE LOGIC TERMINAL BOARD.

Applications for licenses under the following 12 patents may be addressed to: Patent Counsel, General Electric Company, Wiring Device Products Department, 95 Hathaway St., Providence, R.I., 02940.

D. 229,667. WALLPLATE.

D. 230,699. WALLPLATE OR SIMILAR ARTICLE.

3,638,171. TERMINAL STRUCTURE FOR WIRING DEVICES.

3,657,936. DIMMER POTRENTIOMETER SWITCH.

3,680,031. GROUNDING DEVICE FOR MOUNTING STRAP.

3,718,894. RESILIENTLY REINFORCED NEMA CONTACT.

3,812,445. BE-CU CONTACT FOR NEMA CONTACT.

3,818,212. DECORATIVE GUIDE LIGHT.

3,818,213. CAST RESIN GLOW LAMP PRODUCT.

3,740,701. PROTECTIVE CONNECTOR DEVICES.

3,821,686. PROTECTIVE CONNECTOR DEVICES.

D. 230,700. WALLPLATE OR SIMILAR ARTICLE.

Applications for licenses under the following 15 patents may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,537,132. HOUSEHOLD REFRIGERATOR WITH THROUGH-THE-DOOR ICE SERVICE.

3,537,273. HOUSEHOLD REFRIGERATOR INCLUDING EXTERIOR ICE SERVICE.

3,537,618. ICE PIECE DISPENSER INCLUDING STALL ELIMINATING MEANS.

3,704,964. HERMETIC REFRIGERATOR COMPRESSOR.

3,838,579. LOCKING AND SEALING SYSTEM FOR ROOM AIR CONDITIONERS.

3,838,580. AIR CONDITIONING CHASSIS GROUNDING SYSTEM.

3,838,635. COMPACTOR WITH RAM MEANS HAVING AN AUTOMATICALLY MOVABLE RAM HEAD.

3,841,677. COMBINATION LATCHING AND SWITCHING MECHANISM.

3,843,066. WASTE DISPOSER APPARATUS.

3,844,441. RADIUSED MOLD WALLS FOR PLASTIC TUBS.

3,847,111. FLOW-COATING APPARATUS.

3,850,008. ICE MAKER.

3,850,185. MEANS IN A DISHWASHING MACHINE FOR STARTING THE OPERATIONAL CYCLE THEREOF.

3,851,943. RACK SUPPORT ASSEMBLY IN A DISHWASHER.

3,854,579. PACKAGED ARTICLE INCLUDING BLOCKING AND CUSHIONING MEANS.

Applications for licenses under the following 22 patents may be addressed to: Division Patent Counsel, General Electric Company, Building 43, Room 529, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

3,069,299. PROCESS FOR PRODUCING MAGNETIC MATERIAL.

3,096,222. GRAIN ORIENTED SHEET METAL.

3,099,552. METHOD OF MAKING LOW SULFUR STEEL.

3,108,912. MAGNETIC MATERIAL.

3,147,157. FABRICATION OF MAGNETIC MATERIAL.

3,147,158. PROCESS FOR PRODUCING CUBE-ON-EDGE ORIENTED SILICON IRON.

3,158,516. METHOD FOR PRODUCING ALLOY BODIES HAVING IMPROVED MAGNETIC PROPERTIES.

3,162,554. HEAT TREATMENT OF GRAIN ORIENTED STEEL TO OBTAIN A SUBSTANTIALLY CONSTANT MAGNETIC PERMEABILITY.

3,164,496. MAGNETIC MATERIAL AND METHOD OF FABRICATION.

3,184,346. GRAIN ORIENTED SHEET METAL HAVING A VANADIUM NITRIDE DISPERSION.

3,188,249. METHOD OF IMMERSING CUBE-ON-EDGE ORIENTED SILICON-IRON IN SILICON-IRON BATH FOLLOWED BY ANNEALING TO FORM A CUBE-ON-EDGE ORIENTED SILICON-IRON PRODUCT.

3,214,303. PROCESS OF RETAINING A DISPERSED SECOND PHASE UNTIL AFTER THE TEXTURE DEVELOPING ANNEAL.

3,223,602. IRON-SILICON ALLOYS AND TREATMENT THEREOF.

3,354,345. LIGHTNING ARRESTER SPARK GAP HAVING ARC-CONFINING CHAMBER WALLS OF GRADED POROSITY.

3,409,480. METHOD OF HEAT TREATING SILICON STEEL SHEET.

3,501,135. FURNACE WITH SEPARABLE SECTIONS FOR HEATING SILICON STEEL STRIP.

3,575,739. SECONDARY RECRYSTALLIZATION OF SILICON IRON WITH NITROGEN.

3,586,913. HIGH VOLTAGE LIGHTNING ARRESTER HAVING A DISCHARGE SURGE COUNTING DEVICE MOUNTED ON ITS TOP TERMINAL BY INSULATING MEANS.

3,614,532. TRIGGERED VACUUM GAP KEEP-ALIVE CIRCUIT.

3,619,766. VERNIER VOLTAGE REGULATOR.

3,819,892. FAIL SAFE VACUUM TYPE CIRCUIT INTERRUPTER AND ASSOCIATED LOAD CURRENT TAP CHANGER FOR ELECTRIC INDUCTION APPARATUS.

3,848,178. COMBINED POWER AND INSTRUMENT POTENTIAL TRANSFORMER.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the licensing policy of each agency-sponsor.

Copies of patents are available from the Commissioner of Patents, Washington, D.C. 20231, at $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161, at the prices cited. Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent Office. Claims and other technical data can usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 476,500. Method of Preparing Gas Tags for Identification of Single and Multiple Failures of Nuclear Reactor Fuel Assemblies. Filed June 5, 1974. PC $3.75/MF $2.25.

Patent application 481,262. Fast-Neutron Solid-State Dosimeter. Filed June 20, 1974. PC $3.25/MF $2.25.

Patent application 484,740. Phase Control in High Resolution Electron Microscopy. Filed July 1, 1974. PC $3.25/MF $2.25.

Patent application 486,924. Pipe Gripper. Filed July 9, 1974. PC $3.25/MF $2.25.

Patent application 487,323. Thermochemical Production of Hydrogen. Filed July 10, 1974. PC $3.25/MF $2.25.

Patent application 487,326. Failure Limiting Pipe Expansion Joint. Filed July 10, 1974. PC $3.25/MF $2.25.

Patent application 489,215. Method of Apparatus for Fabricating a Composite Structure Consisting of a Filamentary Material in a Metal Matrix. Filed July 17, 1974. PC $3.25/MF $2.25.

Patent application 489,305. Whole Blood Analysis Rotor for a Multistation Dynamic Photometer. Filed July 17, 1974. PC $3.25/MF $2.25.

Patent application 490,446. Displaced Electrode Process for Welding. Filed July 22, 1974. PC $3.25/MF $2.25.

Patent application 491,082. A Combined Coal Fired Process for Production of Power and Liquid Fuel. Filed July 23, 1974. PC $3.25/MF $2.25.

Patent application 491,095. Variable Thickness Double-Refracting Plate. Filed July 23, 1974. PC $3.75/MF $2.25.

Patent 3,797,804. Atmospheric Closure Mechanism. Filed Feb. 6, 1973. Patented Mar. 19, 1974. Not available NTIS.

Patent 3,801,446. Radioisotope Fueled Heat Transfer System. Filed June 5, 1968. Patented Apr. 2, 1974. Not available NTIS.

Patent 3,806,625. High-Voltage Feedthrough Assembly. Filed Mar. 16, 1973. Patented Apr. 23, 1974. Not available NTIS.

Patent application 474,547. Controlled Porosity Filter and Uniform Structure Composites. Filed May 30, 1974. PC $4.00/MF $2.25.

Patent 3,801,446. Radioisotope Fueled Heat Transfer System. Filed June 5, 1968. Patented Apr. 2, 1974. Not available NTIS.

Patent 3,805,552. Radial Spline Guide Bearing Assembly. Filed Oct. 17, 1972. Patented Apr. 23, 1974. Not available NTIS.

Patent 3,805,890. Helical Coil Heat Exchanger. Filed Dec. 12, 1972. Patented Apr. 23, 1974. Not available NTIS.

Patent 3,807,257. Apparatus and Method for Delivering Vibratory Energy. Filed Nov. 17, 1972. Patented Apr. 30, 1974. Not available NTIS.

Patent 3,821,747. Recording System Having Piezoelectric Stylus Drive Means. Filed Apr. 23, 1974. Patented June 28, 1974. Not available NTIS.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

Patent application 368,578. Enzyne Electrode. Filed June 11, 1973. PC $3.25.

Patent 3,843,974. Intimal Lining and Pump With Vertically Drafted Webs. Filed Jan. 5, 1972. Patented Oct. 29, 1974. Not available NTIS.

Patent 3,846,353. Nonthrombogenic Plastic Material and Method for Making the Same. Filed June 8, 1970. Patented Nov. 5, 1974. Not available NTIS.

DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va.

Patent 3,757,256. Surface Wave Transducers With Cancellation of Secondary Response. Filed Aug. 2, 1971. Patented Sept. 4, 1973. Not available NTIS.

Patent 3,757,287. Sea Bottom Classifier. Filed Apr. 6, 1972. Patented Sept. 4, 1973. Not available NTIS.

Patent 3,757,312. General Purpose Associative Processor. Filed Oct. 9, 1970. Patented Sept. 4, 1973. Not available NTIS.

Patent 3,757,720. Control Surfaces for Submersible Vehicles. Filed Oct. 19, 1971. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,757,722. Submersible Underway Docking Unit. Filed Apr. 21, 1972. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,757,725. Right Spherical Segment-Glass Shell To Metal-Joint. Filed Sept. 24, 1971. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,758,071. Magnetically-Actuated Fluid Control Valve. Filed Nov. 1, 1971. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,758,382. Process of Freezing Blood Using a Hydroxyalkyl Starch as Cryoprotective Agent. Filed July 26, 1968. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,758,868. Noise-Riding Slicer. Filed Dec. 21, 1971. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,758,886. Versatile in Line Waveguide to Coax Transition. Filed Nov. 1, 1972. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,759,092. Differential Pressure Transducer and Readout for Sensing Claw Grip Force. Filed June 9, 1971. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,757,042. Pan and Tilt Underwater Optical Viewing System With Adjustable Source—Receiver Separation and Zoom Lenses. Filed Feb. 18, 1972. Patented Sept. 4, 1973. Not available NTIS.

Patent 3,757,247. Frequency Selective Optical Isolator. Filed June 22, 1972. Patented Sept. 4, 1973. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patents Matter, NASA—
Code GP–2, Washington, D.C. 20590

Patent application 513,690. Zero Torque Gear Head Wrench. Filed Oct. 10, 1974. PC $3.25/MF $2.25.

Patent application 518,545. Translatory Shock Absorbers for Attitude Sensors. Filed Oct. 29, 1974. PC $3.25/MF $2.25.

Patent application 518,546. Apparatus for Measuring the Ferrite Content of Austenitic Stainless Steel Weld Material. Filed Oct. 29, 1974. PC $3.25/MF $2.25.

Patent application 518,685. An Improved Static Pressure Probe. Filed Oct. 29, 1974. PC $3.25/MF $2.25.

Patent application 521,006. An Improved Heat Exchanger. Filed Nov. 5, 1974. PC $3.25/MF $2.25.

Patent application 521,602. An Improved Portable Peening Gun. Filed Nov. 6, 1974. PC $3.25/MF $2.25.

Patent application 521,603. Carbon Monoxide Monitor. Filed Nov. 6, 1974. PC $3.25/MF $2.25.

Patent application 424,590. Hall Effect Magnetometer. Filed Dec. 13, 1973. PC $3.25/MF $2.25.

Patent application 500,982. Self-Energized Plasma Compressor. Filed Aug. 27, 1974. PC $3.25/MF $2.25.

Patent application 506,803. Bonding of Sapphire to Sapphire by Eutectic Mixture of Aluminum Oxide and Zirconium Oxide. Filed Sept. 17, 1974. PC $3.25/MF $2.25.

Patent application 506,804. A Holographic Motion Picture Camera. Filed Sept. 17, 1974. PC $3.25/MF $2.25.

Patent application 508,803. Method and Apparatus for Detecting Flaws in Elongated Bodies. Filed Sept. 24, 1974. PC $3.25/MF $2.25.

Patent application 512,825. Two Feed Dish Antenna Having Switchable Beamwidth. Filed Oct. 4, 1974. PC $3.25/MF $2.25.

Patent application 513,613. Catalytic Trimerization of Aromatic Nitriles and Triaryl-S-Triazine Ring Cross-Linked High Temperature Resistant Polymers and Copolymers Made Thereby. Filed Oct. 10, 1974. PC $3.75/MF $2.25.

Patent application 514,546. A Method and Apparatus for Compensating Reflection Losses in a Path Length Modulated Absorption-Absorption Trace Gas Detector. Filed Oct. 15, 1974. PC $3.25/MF $2.25.

Patent 3,835,318. Fast Scan Control for Deflection Type Mass Spectrometers. Patented Sept. 10, 1974. Not available NTIS.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents

Washington, D.C. 20545

Patent 3,783,189. Television System for Precisely Measuring Distances. Filed June 1, 1972. Patented Jan. 1, 1974. Not available NTIS.

Patent 3,800,256. Energy Storage and Switching With Superconductors. Filed Apr. 24, 1973. Patented Mar. 26, 1974. Not available NTIS.

Patent 3,801,445. Thermionic Reactor Electrical Control System. Filed Sept. 28, 1972. Patented Apr. 2, 1974. Not available NTIS.

Patent 3,803,416. Slotted Coaxial Germanium Gamma-Ray Camera. Filed Nov. 28, 1972. Patented Apr. 9, 1974. Not available NTIS.

Patent 3,805,119. Superconductor. Filed July 12, 1972. Patented Apr. 16, 1974. Not available NTIS.

Patent 3,816,771. Plasma Energy to Electrical Energy Converter. Filed Feb. 9, 1973. Patented June 11, 1974. Not available NTIS.

Patent 3,817,746. Ductile Superconducting Alloys. Filed Nov. 14, 1972. Patented June 18, 1974. Not available NTIS.

DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St. SW.

Washington, D.C. 20590

Patent application 516,448. Signal Conditioner Front-Ends. Filed Oct. 21, 1974. PC $3.25/MF $2.25.

ENVIRONMENTAL PROTECTION AGENCY

Room W513, 401 M St. SW.

Washington, D.C. 20460

Patent 3,635,034. Method of Plugging Mine Passages Having Water Emanating Therefrom. Filed July 9, 1969. Patented Jan. 18, 1972. Not available NTIS.

Patent 3,672,173. Forming Self-Supporting Barriers in Mine Passages and the Like. Filed May 13, 1969. Patented June 27, 1972. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—

Code GP–2, Washington, D.C. 20546

Patent application 508,784. Process for Fabricating Sic Semiconductor Devices. Filed Sept. 24, 1974. PC $3.25/MF $2.25.

Patent application 483,850. An Externally Supported Internally Stabilized Flexible Duct Joint. Filed June 27, 1974. PC $3.25/MF $2.25.

Patent application 483,857. Rapid Activation and Checkout Device for Batteries. Filed June 27, 1974. PC $3.25/MF $2.25.

Patent application 505,880. Improved Structure and Method of Producing Composite of Gapped and Ungapped Cores. Filed Sept. 13, 1974. PC $3.25/MF $2.25.

Patent application 510,677. Solar Cell Assembly. Filed Sept. 30, 1974. PC $3.25/MF $2.25.

Patent application 510,678. Method of Manufacturing Composite Superconductors. Filed Sept. 30, 1974. PC $3.25/MF $2.25.

Patent application 511,346. An Attitude Control System. Filed Oct. 2, 1974. PC $3.25/MF $2.25.

Patent application 511,894. Aircraft Mounted Crash Activated Transmitter Device. Filed Oct. 3, 1974. PC $3.25/MF $2.25.

Patent application 513,612. Hingeless Helicopter Rotor With Improved Stability. Filed Oct. 10, 1974. PC $3.25/MF $2.25.

Patent application 513,689. Miniature Hydraulic Actuator. Filed Oct. 10, 1974. PC $3.25/MF $2.25.

Patent 3,837,285. Open Tube Guideway for High Speed Air Cushioned Vehicles. Patented Sept. 24, 1974. Not available NTIS.

Patent 3,840,829. Integrated p-Channel MOS Gyrator. Patented Oct. 8, 1974. Not available NTIS.

Availability of Patents Official Gazette January 28, 1975, Volume 930/No. 4

Additional copies of the January 28, 1975, Patents OFFICIAL GAZETTE containing Patent Applications published under the Trial Voluntary Protest Program are available for public distribution.

Copies may be obtained at the single copy price of $6.60 each. Remittance must accompany order. Address orders to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

WILLIAM I. MERKIN,

Acting Assistant Commissioner for Administration.

Feb. 18, 1975.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 2, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-6-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-2-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-6-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-17-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-6-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	6-26-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-30-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-1-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-20-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	9-10-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	6-20-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-1-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-23-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-25-74

Expiration of patents: The patents within the range of numbers indicated below expire during February 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,821,713 to 2,825,063, inclusive
Plant Patents..... Numbers 1,677 to 1,685, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MARCH 4, 1975

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T932,001
ETHYLENE/ETHYLENICALLY UNSATURATED CARBOXYLIC ACID/UNSATURATED ESTER LOW MOLECULAR WEIGHT INTERPOLYMERS USEFUL AS ADHESIVES

George E. Waples, Jr., 503 Sycamore; Michael B. Smithers, 500 Willow Drive; and Ben W. Heinemeyer, 118 Pecan Lane, all of Lake Jackson, Tex. 77566

Continuation-in-part of abandoned application Ser. No. 169,869, Aug. 6, 1971. This application July 30, 1973, Ser. No. 384,155

Claims priority, application Canada, July 5, 1972, 146,369

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.8

No Drawing. 22 Pages Specification

Low molecular weight interpolymers of ethylene, ethylenically unsaturated carboxylic acid such as acrylic acid and ethylenically unsaturated ester such as ethyl acrylate or vinyl acetate which interpolymers have viscosities from about 500 to about 10,000 centipoises at 350° F. are useful as adhesives, particularly as adhesives in the lamination of non-adhering plastic materials to glass.

T932,002
PURIFICATION OF WET-PROCESS PHOSPHORIC ACID WITH METHANOL AND AMMONIA

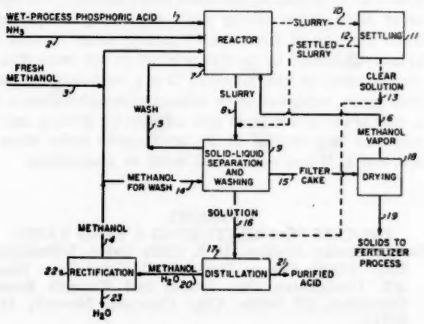
John F. McCullough, 2909 Alexander, and Leland L. Frederick, Rte. 5, Box 303-B, both of Florence, Ala. 35630

Filed Oct. 12, 1973, Ser. No. 406,103

Int. Cl. C01b *25/16*

U.S. Cl. 423—321

3 Sheets Drawing. 35 Pages Specification



Improved process for partial purification of merchant-grade wet-process phosphoric acid with co-production of impure phosphoric acid or solid fertilizer materials containing from 50 to 95 percent of the impurities originally present in the crude acid. Crude acid is treated with from 2.5 to 4.2 pounds of methanol per pound of P_2O_5 and with from 0.26 to 0.4 equivalents of a soluble ammonium compound per mole of P_2O_5 to precipitate most of the metallic and fluorine impurities and 7 to 14 percent of the P_2O_5 as solid ammonium metallic phosphates and fluoride compounds. The reaction mixture is maintained at temperatures from 35° C. to its boiling point (about 70° C.) for 15 to 90 minutes to form slurries that filter and settle rapidly. The solids are separated from the reaction mixture and methanol is distilled from the resulting clarified solution to form concentrated partially purified acid. The solid ammonium metallic phosphates contain from 44 to 54 percent P_2O_5, all of which is available and about 50 percent is water soluble by AOAC procedures. Alternately, the reaction slurry is separated into a clarified liquid fraction and a settled slurry fraction. Methanol is distilled from the settled fraction, which causes most of the impurities to redissolve, yielding impure phosphoric acid.

T932,003
YARN BREAK DETECTOR

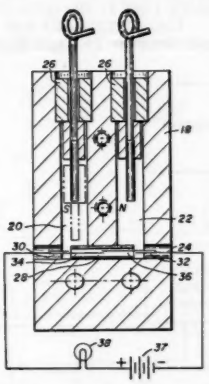
Thomas J. Strawser, Frostburg, Md.
(% Celanese Fibers Co., Box 444, Cumberland, Md.)

Continuation of application Ser. No. 151,409, June 9, 1971. This application Nov. 30, 1973, Ser. No. 420,415

Int. Cl. G08b *21/00*

U.S. Cl. 340—259

1 Sheet Drawing. 9 Pages Specification



A yarn break detector suitable for yarns having tensions down to 0.1 gram and comprising a body provided with a passageway, a pin extending into said passageway so as to be movable longitudinally therein from a withdrawn position to a forward position, said pin being provided with a yarn guiding surface, a magnet connected to the end of said pin within said passageway so as to be movable therewith, a magnetically actuated switch positioned within said body at a location adjacent the magnet when said pin is in one of said withdrawn or forward positions, and an electrically actuated indicator whose circuit is opened or closed by said magnetically actuated switch, whereby when a yarn runs over the guide surface

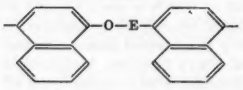
of said pin the tension in said yarn holds said pin and magnet in one of said two positions and the magnetic switch and indicator are in predetermined operating conditions, and upon a break in the yarn the release to their second positions, the magnetic switch and thus the indicator change their operating conditions so as to give an indication of the yarn break.

T932,004
AROMATIC POLYCARBONATES

Ronald George Feasey, Knebworth, and John Leslie Freeman, Huntingdon, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of application Ser. No. 252,555, May 12, 1972. This application Dec. 17, 1973, Ser. No. 425,282
Int. Cl. C08g *17/13*
U.S. Cl. 260—47 XA
No Drawing. 12 Pages Specification

A polymer is provided having recurring units of the formula

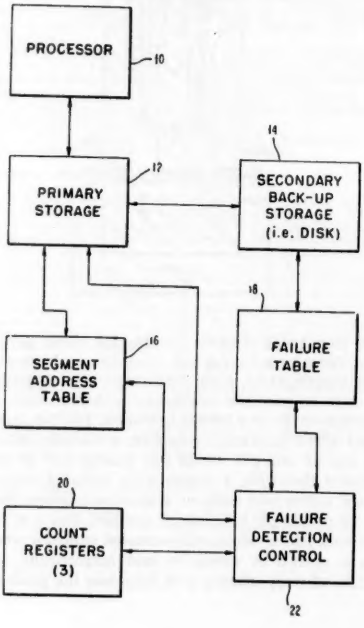


where is preferably a direct link or may be a group having the formula —X—O— where X is a ketone or divalent polymethylene group.

T932,005
DETECTION OF POSSIBLY ERRONEOUS SEGMENTS FOLLOWING FAILURES IN PRIMARY STORAGE

Vincent J. Kruskal, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,303
Int. Cl. G06f *11/06*; G11c *29/00*
U.S. Cl. 235—153 AM
15 Sheets Drawing. 23 Pages Specification



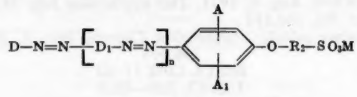
A method for detecting possibly erroneous memory segments in a hierarchical memory system having at least a primary and secondary back-up memory following failure in the primary storage of said system. The method generally includes keeping certain statistical data concerning the transfer of data segments into and out of said primary storage whereby automatic validity checking procedures can be performed to determine the probable accuracy of the current contents of said primary memory.

T932,006
SOLUBILIZED MONO AND DISAZO DYES

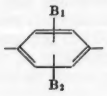
Hans Alfred Stingl, 852 Ocean View Drive, Toms River, N.J. 08753

Continuation of abandoned application Ser. No. 180,493, Sept. 14, 1971. This application Jan. 7, 1974, Ser. No. 431,517
Int. Cl. C09b *29/10, 29/12, 31/06*
U.S. Cl. 260—163
No Drawing. 38 Pages Specification

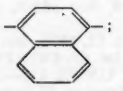
Dyestuffs of the formula



wherein D_1 is a phenylene group of the formula



wherein B_1 and B_2 are each independently hydrogen, C_{1-5}-alkyl, C_{1-5}alkoxy, chloro or bromo, or D_1 is a group of the formula



n is 0 or 1; A and A_1 are each independently hydrogen, lower alkyl, lower alkoxy and halogen; R_2 is a straight chain alkylene of from 2 to 4 carbon atoms or said alkylene substituted by methyl or ethyl on not more than 2 carbon atoms of said alkylene; D is a residue of the benzene series, naphthalene or sulfonamidonaphthalene-1 or 2, said D being free from acid solubilizing groups; and D may also be a residue of the heterocyclic series when *n* is 0; and M is hydrogen, alkali metal or ammonium.

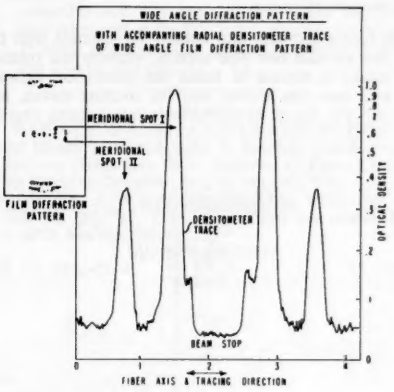
T932,007
PROCESS FOR TEXTURING A FEED YARN

Donald Rocky Bradley, 10 S. Cliffe Drive, Wilmington, Del. 19809; George Daniel Null, Good Hope Road, #2, Landenberg, Pa. 19350; and Kenneth Bedros Takvorian, 22 White Clay Crescent, Newark, Del. 19711

Filed Feb. 19, 1974, Ser. No. 443,206
Int. Cl. D02g *1/02*
U.S. Cl. 57—157 TS
2 Sheets Drawing. 26 Pages Specification

A process for texturing a feed yarn is provided wherein the feed yarn is comprised of a plurality of continuous substantially straight filaments constituted at least 90% by weight of repeating polymeric units of bis(4-cyclohexylene) methane dodecanediamide (PACM–12) with at least 60% of the bis(4-cyclohexylene) methane (PACM) portion of the units being in the trans-trans isomer form and

have a crystallinity index less than 20. The process comprises false-twist texturing the said feed yarn by twisting the filaments to at least 50 turns per inch (t.p.i.), heating the twisted filaments until the crystallinity index increases



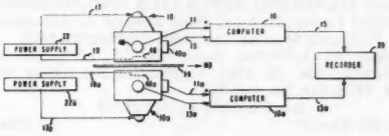
by at least 0.5 units but not over a total of about 35 units, cooling and untwisting the filaments in a continuous operation to give an improved false-twisted yarn having adequate stretch, and fabrics therefrom having good wear-wrinkle recovery and good tailorability.

T932,008

APPARATUS FOR DETERMINING FIBER DIRECTIONALITY IN MOVING WEB STRUCTURES

Latham S. Davis, 700 Minor Terrace, Winter Haven, Fla. 33880, and Richard A. Satterfield, 307 Shevel Drive, Goodlettsville, Tenn. 37072

Filed July 11, 1974, Ser. No. 487,816
Int. Cl. G01n *21/30*
U.S. Cl. 250—571
3 Sheets Drawing. 8 Pages Specification



An apparatus to determine fiber directionality in moving web structures. The apparatus uses a fiber property of directional reflectance of collimated light to establish fiber position (direction). Collimated light is projected onto a web surface and the scattered reflected light is sensed by multiple optical sensors. Since light is reflected greatest perpendicular to the direction of the fiber axis, a measure of overall fiber directionality is obtained by comparing the pickup of strategically placed photo sensors. The apparatus includes three sections: scanning heads for monitoring upper and lower web surfaces; electronic circuits to compare the signal outputs of the photo sensors in the scanning heads to obtain related values of fiber directionality; and a controlled power supply and illumination source. The degree of illumination is controlled by the general brightness of the material being measured so that a constant level of reflectance is maintained.

REISSUES

PUBLISHED MARCH 4, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,350

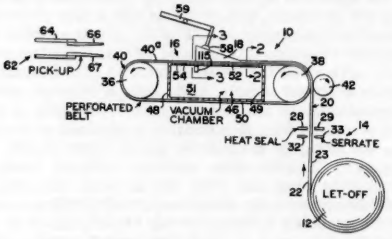
BAG HANDLING APPARATUS AND METHOD

Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Systems, Inc., Bedford Heights, Ohio

Original No. 3,579,948, dated May 25, 1971, Ser. No. 731,672, Apr. 29, 1968. Application for reissue May 23, 1973, Ser. No. 363,122

Int. Cl. B65b *43/04, 43/30*

U.S. Cl. 53—29 17 Claims



13. A method of opening a bag including:

a. advancing a chain of bags toward a loading station along a path of travel;

b. engaging and supporting a leading bag of the chain and at least a portion of a succeeding bag while advancing said chain;

c. opening an end of said leading bag with the open end facing in the direction of travel of said chain;

d. engaging said open end of said leading bag; and

e. detaching said leading bag from said succeeding bag while maintaining said succeeding bag engaged and supported on said path of travel.

28,351

PIPE HANDLING APPARATUS

Norman D. Dyer, Beaumont, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Original No. 3,446,284, dated May 27, 1969, Ser. No. 667,957, Sept. 15, 1967. Application for reissue Dec. 5, 1969, Ser. No. 888,182

Int. Cl. E21b *19/16*

U.S. Cl. 173—164 14 Claims

1. Apparatus for unscrewing selected threaded connections between sections of pipe and the like wherein each pipe section has flats on the exterior thereof, said apparatus comprising:

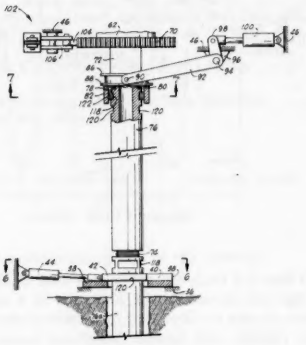
rotating means engageable with one of the pipe sections for rotating the pipe, said rotating means including a chuck member slidingly mounted thereon, said chuck member having an opening extending coaxially therethrough with respect to the axis of said pipe;

moving means for displacing said rotating means and pipe along the axis of said pipe;

wrench means adapted to be positioned in the flats and sized to be received within said opening in engagement with said chuck member;

chuck actuating means for moving said chuck member into engagement with said wrench means holding said wrench means in said flats connecting said one pipe section and rotating means for common rotation; and,

slip means movable into holding engagement with the flats on said one pipe section, whereby the rotating means is rotated to break the connection between said one pipe section and the rotating means, and said slip means being movable into holding engagement with the flats on the subjecent pipe section upon movement of said pipe sections by said moving means, whereby rotation of the rotating means rotates said one pipe section engaged by the wrench means and unthreads the connection between the pipe sections.



28,352

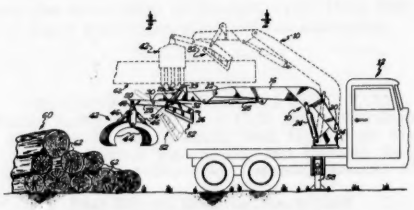
HEEL BOOM LOG GRAPPLING APPARATUS

Robert W. Larson, Thunder Bay, Ontario, Canada, assignor to Dico Company, Inc., Des Moines, Iowa

Original No. 3,165,215, dated Jan. 12, 1965, Ser. No. 218,927, Aug. 23, 1962. Application for reisue Sept. 13, 1973, Ser. No. 396,679

Int. Cl. B66c *1/42*

U.S. Cl. 214—147 AS 8 Claims



2. A heel boom log grappling apparatus comprising:

(a) a main boom assembly,

(b) a heel boom member,

(c) means mounting said heel boom member to the free end of said main boom assembly for pivotal movement in the general plane of said assembly,

(d) a grapple for picking up logs,

(e) means mounting said grapple to one end of said heel boom member for pivotal movement in the said general plane of said main boom assembly,

(f) downwardly facing cradle means fixedly carried at the other end of said heel boom member, and

(g) hydraulic means extending between said main boom assembly and said heel boom member for forcing said other end of the heel boom member downwardly to effect engagement of said cradle means to level a log held by said grapple.

28,353

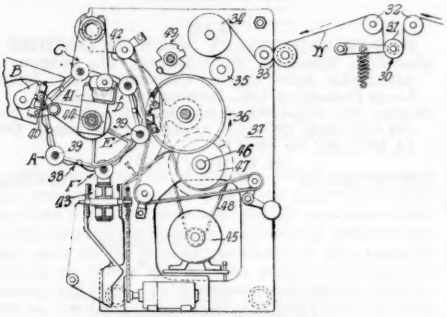
WEB-WINDING APPARATUS AND METHOD

Ernst Daniel Nystrand, John J. Bradley, and Harvey J. Spencer, Green Bay, Wis., assignors to Paper Converting Machine Company, Inc., Green Bay, Wis.

Original No. 3,179,348, dated Apr. 20, 1965, Ser. No. 223,994, Sept. 17, 1962. Application for reissue Sept. 1, 1972, Ser. No. 285,877

Int. Cl. B65h *19/26*

U.S. Cl. 242—56 A **19 Claims**



1. In web-winding apparatus equipped with a frame,

(A) a roll rotatably supported on said frame, means for rotating said roll, means for feeding a web onto said roll for travel therewith while in partial wrapping engagement with said roll,

(B) said frame also being equipped with a plurality of mandrels, means for moving said mandrels sequentially through a path in close proximity to the surface of said roll, the improvement comprising:

(C) means for transversely severing said web to provide a free leading edge on said web for approaching a mandrel on which said web is to be wound in said path, [and]

(D) *pin* means *extensibly mounted on said roll* for maintaining a web portion spaced from said edge in contact with said roll, *and pusher means extensibly mounted on said roll to urge said maintained web portion against an adjacent mandrel.*

28,354

BEARING CONSTRUCTION

Stanley S. Orkin, Rockville, Conn., assignor to Kamatics Corporation, Bloomfield, Conn.

Original No. 3,685,878, dated Aug. 22, 1972, Ser. No. 40,200, May 25, 1970. Application for reissue Nov. 13, 1973, Ser. No. 415,492

Int. Cl. F16c *33/04*

U.S. Cl. 308—238 **2 Claims**

1. A self-lubricated bearing assembly comprising two bearing members having coengaging surfaces which are movable relative to one another, the surfaces of one of said members consisting essentially of a solid polymeric organic lubricant material selected from the group consisting of polyimide and polytetrafluoroethylene and the surface of the second of said members being provided by a body of ceramic material selected from the group consisting of aluminum oxide, chromium oxide, titanium dioxide, tungsten carbide, titanium carbide, chromium carbide and their mixtures, said body of ceramic material comprising a coating having a thickness ranging from [0.005] *0.0005*

to 0.01 inch on a metallic substrate having a tensile strength ranging from 35,000 to 250,000 p.s.i., said metallic substrate consisting essentially of a metal selected from the group consisting of titanium, titanium base alloys, ferrous alloys, aluminum and aluminum base alloys.

28,355

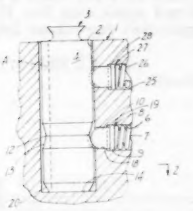
MEANS FOR SECURING AN INSERT TO A BASE PIECE

Nello J. Petri, 2140 Jones St., San Francisco, Calif. 94133

Original No. 3,698,748, dated Oct. 17, 1972, Ser. No. 229,989, Feb. 28, 1972, which is a continuation-in-part of application Ser. No. 122,947, Mar. 10, 1971. Application for reissue Apr. 4, 1973, Ser. No. 347,714

Int. Cl. F16b *12/20*

U.S. Cl. 403—328 **3 Claims**



1. In the combination that includes a base piece and an element secured thereto:

said base piece being formed with [a bore] *an elongated cavity* opening outwardly of *and substantially at right angles to* one face thereof,

said element including a shank adapted to be received in said [bore] *cavity* through the open end thereof,

a first spring pressed element on one side of said [bore] *cavity* urging said shank transversely of said [bore] *cavity* toward the opposite side thereof,

said shank and [bore] *cavity* being formed in cross section to provide two spaced points of engagement between said shank and said [bore] *cavity* at said opposite side,

the cross sectional contour of said shank being smaller than the cross sectional contour of said [bore] *cavity* to provide clearance therebetween whereby the periphery of said shank is engaged only by said [force means] *spring pressed element* and said [bore] *cavity* at said two points to provide stability of said element relative to said base piece,

said [bore] *cavity* being provided with a bottom [rigid with] *fixed with respect to* said base piece and said shank being provided with a camming surface acted upon by said first spring pressed element to urge said shank against said bottom at the same time it is urged toward said opposite side,

a second spring pressed element axially spaced from said first spring pressed element for urging said shank against said opposite side.

28,356
ANTIBACTERIAL AND ANTIFUNGAL TREATMENT WITH SULFONES

Ivan C. Popoff, Ambler, Bernard Buchholz, Blue Bell, and Harold J. Miller, Newtown Square, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Original No. 3,519,630, dated July 7, 1970, Ser. No. 797,255, Feb. 6, 1969, which is a continuation-in-part of application Ser. No. 636,026, May 4, 1967, which in turn is a continuation-in-part of application Ser. No. 553,615, May 31, 1966, both now abandoned. Application for reissue Mar. 26, 1971, Ser. No. 128,596

Int. Cl. A01n *7/00, 9/22*

U.S. Cl. 424—270 **10 Claims**

12. The process for controlling late blight infested plants which comprises contacting said plants with an effective plant bacteria and fungi inhibiting amount of [a compound defined in claim **1**.] *2-methylsulfonyl-5-chlorobenzothiazole.*

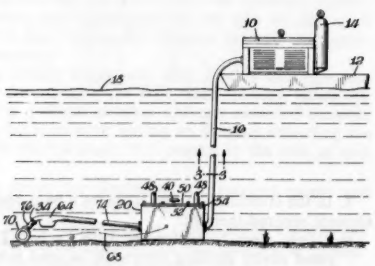
28,357
METHOD AND APPARATUS FOR UNDERWATER ARC WELDING

Ernest H. Berghof, Orlando, Fla., assignor to Anna Welding Corporation

Original No. 3,632,950, dated Jan. 4, 1972, Ser. No. 886,245, Nov. 13, 1969, which is a continuation-in-part of abandoned application Ser. No. 701,700, Jan. 30, 1968. Application for reissue July 2, 1973, Ser. No. 375,685

Int. Cl. B23k *9/16*

U.S. Cl. 219—72 **4 Claims**



2. [A method according to claim **1** which includes the step of:] *A method of underwater electric arc welding a workpiece in which an underwater electric arc is drawn between an electrode being issued from a feeding unit and said workpiece to effect welding on said workpiece and in which water is kept from contact with said arc and the weld area of said workpiece immediately adjacent said arc by:*

externally supplying a shielding gas under a pressure greater than the pressure of said water to said arc and said weld area,

providing said feeding unit with an enclosure and initially pressurizing said enclosure with said shielding gas under pressure greater than said water presure,

ejecting said gas as a stream about said electrode and said arc thereby to form an envelope about said arc and said electrode and to force said water away from said arc and said weld area, and

forming two streams, one being an inner annular gas stream coaxially about said arc and the other being an annular gas stream about said inner stream, each of said streams being directed toward said workpiece and both having a pressure exceeding that of said water, thereby to shield said arc and said weld area from said water.

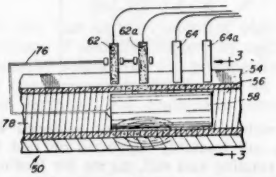
28,358
LINEAR AND ROTARY MAGNETIC MOTORS

Marcel R. Sommeria, Palos Heights, Ill., assignor to Atlanta/La Salle Capital Corporation and Joseph Lucas (Industries) Ltd., Birmingham, England

Original No. 3,534,203, dated Oct. 13, 1970, Ser. No. 686,412, Nov. 29, 1967. Application for reissue Oct. 12, 1972, Ser. No. 297,010

Int. Cl. H02k *37/00*

U.S. Cl. 310—14 **6 Claims**



1. A high-torque, rotary, constant-force electromagnetic machine functionally dependent upon leakage flux, said machine being devoid of permanent magnets, and motive force generated by said machine being produced by means of magnetic flux, which crosses a winding which winding itself produces said flux, said machine comprising:

a first element of readily magnetizable material,

a single magnetizing winding helically coiled about said first element,

a second element generally symmetrically disposed and concentrically supported with respect to said first element,

one of said elements defining within pheripheral bounds thereof a cavity, the other of said elements disposed for movement within said cavity and having a cross-section dimensioned to define a separation between said elements,

said first and second elements revolving relative to one another during energization of said machine,

brush means coupled mechanically to one of said first and said second elements for travel therewith relative to said other of said first and said second elements and in electrical contact with said winding to supply excitation current thereto and to produce a magnetic field within said cavity, to effect relative movement between said first and said second element,

two mutually isolated but substantially identical power sources, and

electrical conductor means connecting [respective] each of said power sources to [current carrying] said brush means to energize opposed sectors of electromagnetic fields of said machine.

28,359

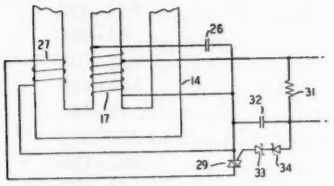
CLOSED LOOP FERRORESONANT REGULATOR

Harry Patrick Hart, Whippany, and Robert John Kakalec, Madison, N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Original No. 3,573,605, dated Apr. 6, 1971, Ser. No. 856,121, Sept. 8, 1969, which is a continuation-in-part of abandoned application Ser. No. 763,882, Sept. 30, 1968. Application for reissue Dec. 6, 1971, Ser. No. 204,848

Int. Cl. G05f *1/46, 1/64*

U.S. Cl. 323—56 **26 Claims**



15. A ferroresonant transformer including a magnetic core structure, a primary winding and a secondary winding wherein the core structure with the secondary winding includes two separate sections providing parallel magnetic paths for the secondary and resonant flux, a control winding on one of said sections, and switch means for opening and closing a circuit across said control winding, with no current source connected to said control winding whereby the only current in said control winding is self induced current resulting from flux in said one section.

28,360

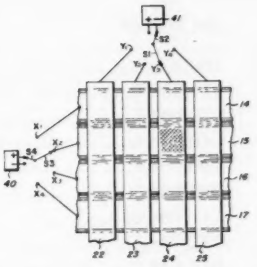
ELECTROPHORETIC COLOR DISPLAY DEVICE

Paul F. Evans and Harold D. Lees, Plano, Tex., and Martin S. Maltz, Rochester, and John L. Dailey, Pittsford, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Original No. 3,612,758, dated Oct. 12, 1971, Ser. No. 863,633, Oct. 3, 1969. Application for reissue Sept. 6, 1973, Ser. No. 394,953

Int. Cl. G02f *1/36;* **H04n** *5/66, 9/12*

U.S. Cl. 358—56 **15 Claims**



1. A visual display device comprising:

an [a] [colorless] insulating fluid containing particles of at least one color pigment in suspension, a substantial amount of said particles having a charge of one polarity;

first electrodes;

second electrodes spaced from said first electrodes, said fluid disposed between said first and second electrodes; and

means for selectively applying an electrical field across individual ones of said first and second electrodes whereby said particles migrate to the electrodes having a polarity opposite to their own causing a color image to be formed on said electrodes.

PATENTS

GRANTED MARCH 4, 1975

ERRATA

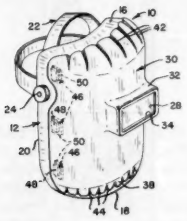
For CLASS	See PATENT NO.
100-45	3,868,903
123-188	3,868,953
190-13	3,869,034
148-37	3,869,037
206-229	3,869,062
179-15	3,869,080
403-225	3,869,157
423-544	3,869,257
149-41	3,969,320
260-326.45	3,869,407
424-236	3,869,539
240-52	3,869,696

PATENTS

GRANTED MARCH 4, 1975

GENERAL AND MECHANICAL

3,868,726
WELDING HELMET
David A. La Marre; Donald A. Smith, both of Woodstock, and Herbert F. Stickney, North Woodstock, all of Conn., assignors to American Optical Corporation, Southbridge, Mass.
Filed Mar. 4, 1971, Ser. No. 121,054
Int. Cl. F16p *1/06*
U.S. Cl. 2—8 **8 Claims**

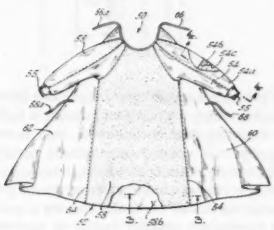


1. A welding helmet comprising:
an opaque facepiece having a window;
means for supporting the facepiece upon the head when the helmet is worn;
a thin disposable covering of opaque, highly radiation-reflective sheet material extending over the major portion of the forward side of said facepiece around said window, said covering being spaced away from said facepiece and cooperating with said facepiece throughout at least a substantial portion of its extent thereover to form channel means adapted to permit circulation of environmental air between said facepiece and covering; and
means for detachably connecting said covering to said forward side of said facepiece.

3,868,727
WELDING HOOD
James W. Paschall, 440 Garden St., Golden, Colo. 80401
Filed Sept. 24, 1973, Ser. No. 399,900
Int. Cl. A61f *9/06*
U.S. Cl. 2—8 **12 Claims**

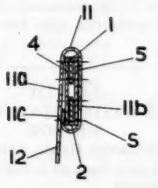
1. A welding helmet for use during electric and gas welding operations comprising a head band for engagement on the user's head to provide support for the helmet, a face shield component mounted on said head band support for positioning to protect the user's face, a supplementary filter plate of lesser size than said shield engaged on said helmet for disposition forwardly of the user's eyes in a direct viewing area for electric welding operations to be undertaken, said face shield being of a shaded translucent material providing luminosity, infrared and ultraviolet transmittance characteristics corresponding to a shade number of at least 3 for the protection of the user's eyes during gas welding operations and for protecting the user's face from flash burns during electric welding operations, and said filter plate being of shaded translucent material providing together with said face shield a total increased eye protection whereby the desired electric welding operations may be undertaken without damage to the user's vision.

3,868,728
SURGICAL GOWN
Henrietta K. Krzewinski, Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Sept. 27, 1973, Ser. No. 401,301
Int. Cl. A41d *13/00*
U.S. Cl. 2—114 **10 Claims**



1. A disposable surgical gown comprising a main sheet having a front portion and side portions, said main sheet having sleeves attached thereto, said front portion having a central operative field comprising a liquid impervious material having an absorbent outer surface, said central operative field extending substantially to the bottom edge of said front portion; the remainder of said main sheet comprising a liquid repellent nonwoven fabric.

3,868,729
COMPOSITE ELASTIC BANDS AND GARMENTS INCORPORATING SUCH BANDS
John Edward Lynam, Mapperley, Nottingham, England, assignor to Automatic Braiding Company (Nottingham) Limited, Sherwood, Nottingham, England
Continuation of Ser. No. 96,529, Dec. 9, 1970, abandoned.
This application Jan. 8, 1973, Ser. No. 321,834
Claims priority, application Great Britain, Jan. 6, 1970, 00580/70
Int. Cl. A41f *9/00*; B32b *3/04*, *7/08*
U.S. Cl. 2—237 **12 Claims**



7. A composite elastic band, as claimed in claim **6**, further including a garment wherein said cover forms a marginal part of said garment and is disposed folded over the outer edges of the core and strip material.

3,868,730

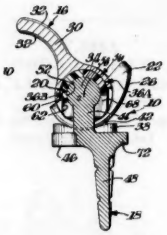
KNEE OR ELBOW PROSTHESIS

Herbert Kaufer; Larry S. Matthews; David A. Sonstegard, all of Ann Arbor, Mich., and Ian P. Murray, Hewitt, N.J., assignors to Howmedica, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 400,202, Sept. 24, 1973, abandoned. This application Feb. 6, 1974, Ser. No. 440,190

Int. Cl. A61f 1/24

U.S. Cl. 3—1 **15 Claims**



1. A joint prosthesis suitable for a knee or elbow comprising a femoral component, a tibial component, a ball and socket connection coupling said components, said femoral component having a pair of spaced substantially parallel spherodically curved condyle runners straddling a hollow central housing, said condyle runners having a front lower portion with a relatively larger radius of curvature joining a rear upper portion having a relatively smaller radius of curvature as compared to said front lower portion, a slot in the bottom of said housing disposed substantially parallel to said runners, a femoral attaching means in the top of said femoral component, said tibial component having a base, tibial connecting means on the bottom of said base, a pair of spherodially curved spaced parallel concave sliding shoes on said base having upper surfaces substantially corresponding with the front lower portions of said condyle runners for intimately nesting them together when said joint is in the extended position, said ball and socket connection including a connecting rod rigidly fixed to and extending upwardly from said base of said tibial component, the ball of said ball and socket connection being disposed on the upper end of said connecting rod, said hollow central housing enclosing the socket portion of said ball and socket connection disposed for entry through its bottom, said ball portion being rotatably engaged in said socket portion, the smaller radius of curvature of said rear upper portions of said runners providing clearance between said shoes and said rear upper portions in flexed positions of said components, said connecting rod being disposed in said slot which permits said connecting rod to pivot through the angle of flexure of said joint, said connecting rod being narrower than said slot, said clearance between said shoes and said rear upper portions being limited to restrain the twisting and wobbling between interfering portions of said shoes and said runners whereby a natural degree of controlled joint twisting and wobbling is provided.

3,868,731

CLOSED CYCLE WASTE TREATMENT SYSTEM AND METHOD

Oliver B. Stahl, 18 Garden Height Apts., Red Bud Rd., Calhoun, Ga. 30701, and Carmen J. Paris, 706 Briarwood Dr., Melbourne, Ill. 60458

Filed Nov. 15, 1972, Ser. No. 306,601

Int. Cl. E03d 11/02, 11/00; B60r 16/04

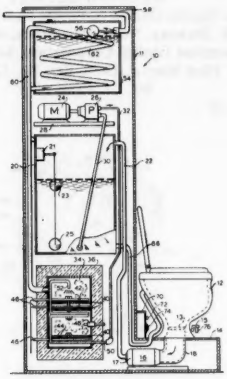
U.S. Cl. 4—10 **13 Claims**

1. A waste treatment system comprising:

means for supplying a waste carrying fluid, said supplying means adapted to be coupled to a waste collection facility;

means adapted to be coupled to said waste collection facility for receiving and comminuting fluid-carried waste therefrom;

means for vaporizing said comminuted fluid-carried waste; and



means for receiving and condensing said vaporized fluid-waste combination and returning constituents thereof to said supplying means.

3,868,732

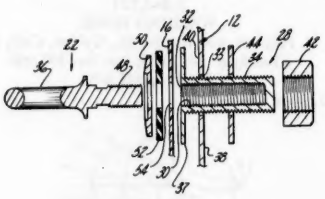
REMOVABLY MOUNTED SWIMMING POOL ACCESSORY ANCHORING DEVICE

John M. Engelhart, Clio, Mich., assignor to Quality Pool Supply Co., Clio, Mich.

Filed July 30, 1973, Ser. No. 383,818

Int. Cl. E04h 3/16, 3/18

U.S. Cl. 4—172 **9 Claims**



1. An anchoring device for a swimming pool, said swimming pool having a wall and a liner, said anchoring device comprising:

a sleeve having both internal and external threads, said sleeve being open to said internal threads at at least one end thereof;

a flange substantially perpendicular to the axis of said sleeve and secured to said sleeve at the open end thereof;

a nut threadably engageable with the external threads of said sleeve whereby to lock the wall of the swimming pool between said flange and said nut after said sleeve is inserted through said wall with the open end of said sleeve facing the interior of said swimming pool,

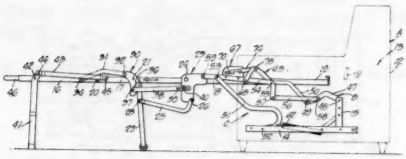
a shank having external threads insertable through a hole in said liner from the inside of said pool wherein the external threads of said shank threadably engage the internal threads of said sleeve to thereby removably mount said shank to said sleeve; and

attaching means secured to said shank.

3,868,733
FOLDING SOFA-BED CONSTRUCTION WITH ADJUSTABLE HEAD SECTION

Melvin P. Spitz, Beverly Hills, and John W. Sproule, both of Laguna Hills, Calif., assignors to Bedline Mfg. Co., Whittier, Calif.

Filed Dec. 13, 1973, Ser. No. 424,475
Int. Cl. A47c 17/14, 17/40
U.S. Cl. 5—13 17 Claims

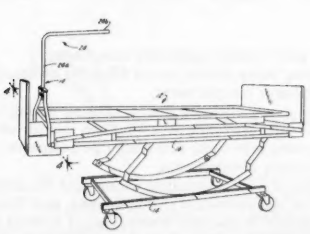


1. In a bed frame structure:
a. a foldable frame with a supporting flexible fabric, said frame including a body section and a head section;
b. pivot means connecting the head section to the body section for swinging movements between a lowered position of use coplanar with the body section and a raised position of use extending at an angle to the body section;
c. an upstanding bracket plate fixedly mounted in association with the body section adjacent the pivot means, said plate having an elongate slot with a side portion providing a latching notch;
d. a linkage connection with the head section adjacent said pivot means including a link pivoted at one end for swinging movement and at its other end having a pin movable in said slot, and upon being positioned in said notch operating to latch the head section in said raised position of use; and
e. means operative in response to a raising movement of the head section for releasing said pin with respect to the notch and permitting subsequent lowering movement of the head section to said coplanar position of use.

3,868,734
HOSPITAL EXERCISE BAR

Roland A. Benoit, and Edmond P. Guillot, both of Danielson, Conn., assignors to Interroyal Corporation, New York, N.Y.

Filed June 19, 1972, Ser. No. 263,356
Int. Cl. A47c 21/00; A61g 7/10
U.S. Cl. 5—317 B 9 Claims

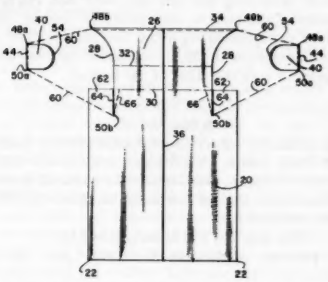


1. An exercise device which is adapted to be used with a bed frame having a pair of hollow tubular frame members at each side and spaced approximately the width of the bed member, comprising a bifurcated base portion whose lower ends spread to the width of the separate hollow tubular frame members and have a foot at each side which is telescopically engageable into the respective hollow tubular frame member at each side of the bed to sustain said base portion, an exercise bar support frame secured to the outer ends of the base member, and an excercise bar portion pivotally mounted on said base portion and extending upwardly and outwardly therefrom for location over the bed.

3,868,735
TOP-FITTED BED SHEET

Mary C. Ross, 421 E. 87th Pl., Chicago, Ill. 60616

Filed Nov. 6, 1973, Ser. No. 413,300
Int. Cl. A47g 9/00
U.S. Cl. 5—334 C 1 Claim

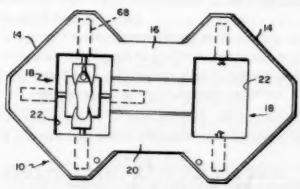


1. A top-fitted bed sheet comprising a single uniform, generally rectangular sheet of material having conventional rectangular corners at one end and a mattress-contoured, end-engaging portion at the other end, comprising essentially arcuate cut-out portions disposed along lateral sides of the sheet terminating in the adjacent corner thereof, side-pocket forming means sewn onto each of said arcuate cut-out portions for providing pockets formed to encompass and to contour with a mattress end portion, and a square-ended extension disposed along an adjacent portion to said arcuate cut-out portions for forming side cover flaps arranged along vertical sides of the mattress when fitted on the mattress, said sidecover flaps having their edges parallel to the sheet and being sewn to the sheet, elastic strips being inserted within a hem along a free side of the arcuate cut-out portions, the sheet material being formed in two parts joined by a hem formed along the mid-portion of the finished sheet, and an elastic strip being applied along the entire foot end of the sheet and the free ends of the cut-out portions.

3,868,736
FOXING AND TOE CAP PRESS

Jaroslav F. Adamik, 30 Barden Ln., Warren, R.I. 08225

Filed June 13, 1973, Ser. No. 369,444
Int. Cl. A43d
U.S. Cl. 12—1 B 19 Claims



1. Apparatus for applying foxing to the bottom part of footwear comprising a bottom support of smaller area than the bottom part so that the bottom part of an article of footwear placed on the bottom support projects beyond the support all around, longitudinally spaced end members situated at oposite ends of the support, transversely spaced side members situated at opposite sides of the support, said end members being constructed to embrace the ends of the bottom and having portions which extend from the ends toward the ball and

breast lines of the bottom and said side members being constructed to engage the sides of the bottom intermediate the ball and breast lines and having portions extending toward the toe and heel which overlap the portions of the end members extending toward the ball and breast lines, a top member situated above the support at the end comprising the forepart portion of the upper said top member being contoured to embrace the forepart of the upper at the toe, means for moving the end members into engagement with the ends of the bottom prior to moving the side members into engagement with the sides of the bottom and means for moving said top member into engagement with the forepart portion of the upper simultaneously with the movement of the side members into engagement with the sides of the bottom.

3,868,737

METHOD AND APPARATUS FOR COMBINED LASTING OF THE TOE, BALL AND SHANK AREAS OF SHOES

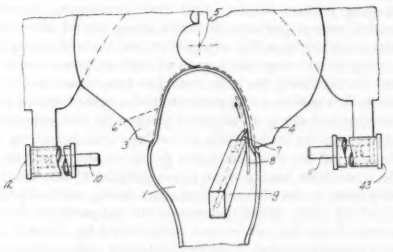
Rudi Fichtner, Rosbach, and Gerhard Lauckhardt, Frankfurt-/Main-Rodelheim, both of Germany, assignors to USM Corporation, Boston, Mass.

Filed Jan. 16, 1974, Ser. No. 433,673

Claims priority, application Germany, Jan. 22, 1973, 2303024

Int. Cl. A43d *21/00*

U.S. Cl. 12—12 **4 Claims**



1. Apparatus for the combined uninterrupted lasting of the toe, ball and shank areas of shoes including: means for applying a strip of cement to the bottom of a shoe around the toe end and extending heelward at least as far as the ball area of the shoe; means for folding and pressing limited portions of the shoe upper margin at opposite sides against the strip of cement near the heelward ends of the strip; means for progressively lasting the upper margin heelward from said limited portions; and lasting the forepart of the shoe as soon as the progressive lasting means has moved to non-interferring locations.

3,868,738

SELF-PROPELLED AUTOMATIC BOWLING LANE MAINTENANCE MACHINE

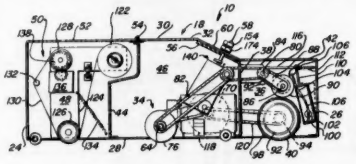
Daniel R. Horst, Erie, and Donald E. Ingermann, Arvada, both of Colo., assignors to Western Sales and Supply Co., Denver, Colo.

Filed Aug. 27, 1973, Ser. No. 392,026

Int. Cl. A47l *11/282*

U.S. Cl. 15—4 **11 Claims**

1. In combination in an automatic bowling lane maintenance machine: a carriage; a reversible drive mechanism housed within said carriage including a drive shaft and surface-engaging drive wheels mounted on said shaft operative to advance same along a predetermined course in a forward and reverse direction; lane-buffing means including a roller and drive therefor, said roller being journalled for rotation in lane-contacting relation about a horizontal axis extending transversely of the direction of machine travel; lane-dressing means detachably connectable to the lane buffing roller including a reservoir for the storage of a lane-dressing fluid and fluid transfer means, said reservoir being mounted adjacent the lane buffing roller for movement relative thereto between an extended and a retracted position, and said fluid transfer means being operative in the extended position of said reservoir to transfer fluid therefrom to the surface of said lane-buffing roller; cam-controlled means connected to the reservoir operative upon actuation and deactuation to shift same



between its extended and retracted positions; cam means connected to the cam-controlled means operative to actuate and deactuate same; power transfer means connected to the carriage drive mechanism; and, manually adjustable means operative upon actuation to vary the distance over the forward and reverse travel of the machine during which the dressing is applied to the lane surface, said means comprising a yieldable friction clutch operatively interconnecting the power transfer means and cam means to define an adjustable driving coupling therebetween.

3,868,739

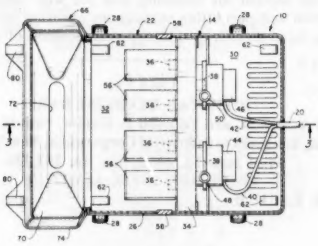
POOL VACUUM APPARATUS

Robert W. Hargrave, 7727 Lubao, Canoga Park, Calif. 91306

Filed Feb. 5, 1973, Ser. No. 329,302

Int. Cl. E04h *3/20*

U.S. Cl. 15—1.7 **7 Claims**



1. A pool vacuum apparatus comprising:

a casing being divided into a filtration compartment and a discharge compartment;

a completely enclosed hollow housing having an inlet and an outlet providing access into an interior chamber, said housing separating said discharge compartment and said filtration compartment;

a filtration means located within said filtration compartment and connected to said housing, said filtration means attached to said inlet whereby water to enter said interior chamber must pass through said filtration means;

pump means attached to said outlet of said housing and receives only water from said interior chamber, said pump means located within said discharge compartment, a discharge means connected to said pump means; and

a vacuum head attached to said casing and located adjacent said filtration means, said vacuum head adapted to permit entry of water and foreign material and guide such towards said filtration means whereby the water is conducted through said filtration means and into said housing and through said pump means and into said discharge

means with the foreign material remaining exteriorly of, or caught within, said filtration means.

3,868,740

VERTICAL, FREELY-SUSPENDED ROTARY BRUSHES FOR AUTOMOBILE/VEHICLE WASHING MACHINES

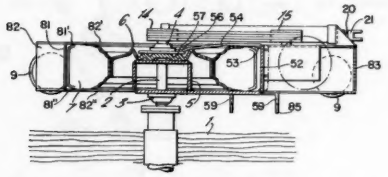
Aanen Brovig, Vagsbygd, Norway, assignor to Aa. Brovig A.S., Kristiansand, Norway

Filed June 4, 1973, Ser. No. 366,614

Claims priority, application Norway, June 13, 1972, 2094/72

Int. Cl. B60s *3/06*

U.S. Cl. 15—21 D **6 Claims**



1. Apparatus for supporting a rotary brush of an automobile washing machine having a fixed frame comprising a sub-frame supported from said fixed frame, a circular plate, a shaft extending through the center of said circular plate and mounted for rotation with respect to said plate, a brush mounted to said shaft, means for rotating said shaft and brush, a flexible air-filled ring secured to said circular plate around the periphery thereof, said air-filled ring being supported by said sub-frame, and the periphery of said flexible air-filled ring being confined against substantial movement with respect to said sub-frame, whereby said brush is supported by said air-filled ring and movement other than said rotary movement when imparted to said brush during operation is transmitted to said air-filled ring and substantially absorbed thereby through flexing of said ring.

3,868,741

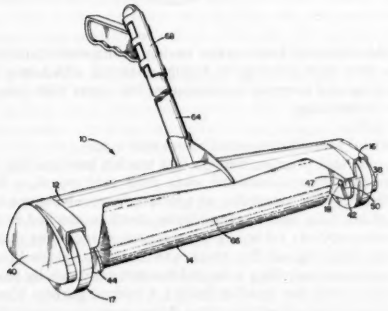
FRICTION DRIVEN ROTARY CLEANING APPARATUS

John H. Coult, 901 N. President St., Wheaton, Ill. 60187

Filed Feb. 23, 1971, Ser. No. 117,937

Int. Cl. E01h *1/05*

U.S. Cl. 15—79 **6 Claims**



1. An apparatus for cleaning dirt and debris from patios, sidewalks, and the like, comprising:

a cylindrical brush having bristles extending from a central shaft;

a pair of wheels, one wheel being disposed at each end of said brush, each of said wheels being mounted on a stub axle;

a one-piece injection-molded plastic housing means for rotatably supporting both ends of said brush shaft and for supporting said axle means such that said wheels turn on a common wheel axis;

transmission means coupling at least one of said wheels and said brush shaft such that wheel rotation causes said brush to rotate; and

a handle joined to said housing means such that said handle and said housing means pivot together about said wheel axis;

the improvement wherein said housing means includes a longitudinal body portion partially surrounding said brush to protect said brush and shield the user from flying debris, said body portion having substantial curvature in planes transverse to said brush shaft to provide structural rigidity for said housing means, said housing means having extending from said body portion a pair of integral end walls and substantially parallel therewith and between said end walls a pair of interior walls integral with said body portion, said end walls and said interior walls supporting for rotation both ends of said brush shaft and said stub axles, said interior walls acting to partially shield said wheels and said transmission means from dust and debris thrown by said brush, said interior walls including open-ended slot means for receiving in a snap-in fit at least one end of each of said stub axles and both ends of said brush shaft.

3,868,742

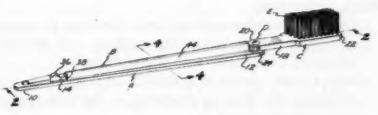
MANUALLY ADJUSTABLE TOOTH BRUSH

I. Edward Brenner, 800 W. Amerige Ave., Fullerton, Calif. 92632

Filed June 5, 1972, Ser. No. 259,443

Int. Cl. A46b *15/00, 9/10*

U.S. Cl. 15—172 **2 Claims**



1. A manually adjustable tooth brush that includes:

a. an elongate one piece rigid handle having first and second end portions, said handle having a first recess therein adjacent said first end portion, and a bore extending longitudinally through said handle from said first recess to said second end portion;

b. an elongate brush assembly that includes an elongate rigid member having first and second ends, a plurality of spaced bristles that extend outwardly from said member adjacent said second end, and said member at said first end defining a transverse semi-circular surface in which a plurality of circumferentially spaced cavities are defined;

c. first means for so pivotally supporting said brush assembly from said second end portion of said handle that said cavities may be successively axially aligned with said bore;

d. a rigid rod having first and second ends, said rod slidably mounted in said bore; and

e. an elongate rigid locking member pivotally supported on said first end of said rod and at least partially disposable in said recess when said locking member is in a first position, with said pivotal locking member when in said first position being axially aligned with said rod and snuggly engaging said recess to maintain said second end of said rod in fixed engagement with a selected one of said

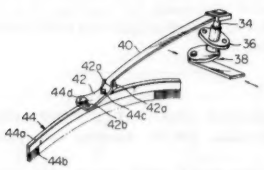
cavities to maintain said brush assembly at one of a plurality of possible positions relative to said handle, said pivotal locking member when in a second position in which it is angularly disposed relative to said rod being longitudinally slidable relative to said recess to the extent that said rod may be moved longitudinally relative to said handle towards said first end portion of said handle to permit disengagement of said second end of said rod from one of said cavities, and said brush assembly thereafter being pivotally movable on said second end portion of said handle to a desired position at which it may be locked relative to said handle by moving said pivotal locking member to said first position to in turn move said rod longitudinally towards said second end portion of said handle to dispose said second end of said rod in one of said cavities.

3,868,743

WIPER ASSEMBLY FOR A MOTOR DRIVEN VEHICLES

Tadao Kakizaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 16, 1973, Ser. No. 351,446
Claims priority, application Japan, Apr. 19, 1972, 47-46449
Int. Cl. B60s *1/40*
U.S. Cl. 15—250.23 **1 Claim**



1. A wiper assembly for wiping a surface of circular convex shape, comprising:
- an annular member with an inner diameter greater than the peripheral diameter of the surface and adapted to be disposed concentric with the surface;
- a wiper arm, means oscillatably moving said wiper arm between two limiting positions on the inner perimeter of said annular member;
- a resilient wiper blade provided with two pins spaced longitudinally thereof; and
- a holder spring hinge connected to said wiper arm and having formed therein a hole and a slot, said holder receiving said two pins in the hole and slot, respectively, for permitting limited rotation of said resilient wiper blade with respect to said holder and biasing said resilient blade to the surface.

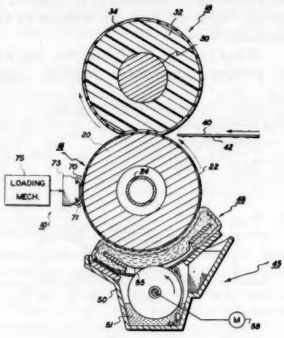
3,868,744

CLEANING APPARATUS FOR HEATED PRESSURE ROLL FUSER

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 221,569, Jan. 28, 1972, abandoned. This application Nov. 24, 1972, Ser. No. 309,543
Int. Cl. G03g *15/12*
U.S. Cl. 15—256.52 **10 Claims**

1. In a fusing system for fusing toner images in an electrostatic copying machine in which a relatively hard heated roll surface is used to fix the toner images to copy sheet material, an improved cleaning apparatus for cleaning toner offset onto the heated roll surface comprising
- a carriage means supporting at least one cleaning roller member in contact with the heated roll surface to be cleaned,
- pressure loading means for urging said carriage means towards the heated roll surface at a predetermined pressure,
- said cleaning roller being exteriorly coated with toner layer covered with a silicone oil film to create sufficient surface energy to collect toner from the heated roll surface,



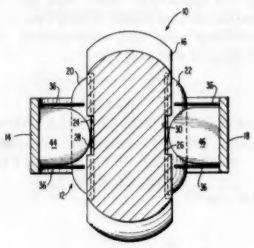
said cleaning roller member further including a core member having a soft deformable thermally insulating cover means to conform to the surface of the heated roll to effect uniform cleaning thereof.

3,868,745

WHEELED CART

John P. Jamison, Rt. 1, Box 315, Mooresboro, N.C. 28114

Filed Apr. 8, 1974, Ser. No. 458,815
Int. Cl. B60b *33/00*
U.S. Cl. 16—41 **9 Claims**



1. An industrial truck caster having an increased tendency to be free from binding by foreign material which may be picked up and wrapped thereabout as the caster rolls along a floor, comprising:
- an axle;
- a wheel rotatably mounted about said axle;
- a yoke, said yoke including a first bracket having a central portion bowed outward away from said wheel, a first flange portion including an aperture for receiving one end of said axle, and a second flange portion attached to the other end of said bowed central portion including means for attaching said first bracket to the industrial truck, said yoke also including a second bracket substantially parallel to said first bracket having a central portion bowed away from said wheel, a first flange portion connected to one end of said bowed central portion for receiving the other end of said axle, and a second flange portion attached to the other end of said bowed central portion including means for attaching said second bracket to the industrial truck;

fastening means for connecting said second flange portion of said first bracket to said second flange portion of said second bracket without interferring with the rotation of said wheel; and

cutting means mounted between said wheel and said bowed portions of said first and second brackets for cutting the foreign material picked up by the caster.

3,868,746

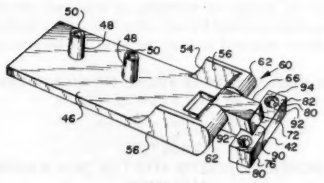
CAST HINGE AND METHOD OF FORMING

Lew Dobrjanskyj, Flushing; Ruediger Einhorn, Katonah, both of N.Y.; Frank D. Flagg, Westport, Conn.; Lee Richard Chasen, Port Chester, and Karl Hannes, White Plains, both of N.Y., assignors to Coats & Clark, Inc., New York, N.Y.

Filed May 15, 1972, Ser. No. 252,996

Int. Cl. E05d *1/100*

U.S. Cl. 16—128 **13 Claims**



1. In a hinge of the type including a hinge body adapted to be connected to a first element, a hinge tab adapted to be connected to a second element, and pivot means between said hinge body and hinge tab to permit swinging of said first and second elements relative to each other between opened and closed positions; the improvement wherein said hinge body has a first substantially flat surface adapted to face away from said first element, a second surface opposite said first surface and adapted to face towards said first element, and a cut out notched section in one end portion of said hinge body extending through said first surface, said hinge tab having a third substantially flat surface adapted to face away from said second element and a fourth surface opposite said third surface and adapted to face toward said second element, said third surface having a shape substantially the same as said cut out section, first pivot means in said hinge body on opposite sides of said cut out section, said hinge tab having second pivot means positioned to engage said first pivot means to allow said hinge body to swing relative to said hinge tab, with said third surface being substantially flush with said first surface and substantially filling said cut out section in the closed position of said elements, said second surface including first means for fastening said hinge body to said first element whereby said first surface has a continuous surface that is, absent of fastening means, said hinge tab further comprising a pair of legs on said fourth surface that extend beyond alignment with said third surface, said pair of legs extending from said hinge tab in directions parallel to the pivot axis formed by said first and second pivot means and being spaced from said end portion of said hinge body a further distance than said first and second pivot means, said legs extending a distance less than the overlying portion of said first surface in said closed position, second means for fastening said legs to said second element, whereby said legs and said second fastening means are aligned with and covered by said first surface in said closed position, flange means on said hinge body extending from the edges of said first surface substantially into alignment with said fourth surface in said closed position, thereby hiding said legs from view in said closed position.

3,868,747

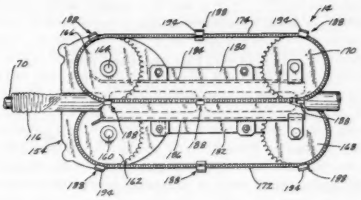
APPARATUS FOR ENCASING A PRODUCT

Ray T. Townsend, and Donald L. Beasley, both of Des Moines, Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Filed Oct. 2, 1972, Ser. No. 294,215

Int. Cl. A22c *11/00*

U.S. Cl. 17—34 **5 Claims**



1. Linking apparatus for use with a product encasing machine, said machine being adapted to expel an elongated casing filled with plastic product and being adapted to rotate said casing about its longitudinal axis; said linking apparatus comprising,

a support;

first and second sets of drive wheels rotatably mounted on said support;

means for rotating said drive wheels;

first and second loop members each comprising a chain trained around said first and second sets of drive wheels respectively, said wheels being adapted to move said chains past a linking station adjacent said casing;

a plurality of pinching members detachably mounted on each of said chains and having pinching surfaces thereon carried around said first and second sets of drive wheels, each of said pinching surfaces on said first loop member being positioned for cooperating with one of said pinching surfaces on said second loop member while passing said linking station so as to collapse said casing therebetween and reduce its cross sectional size,

said chains having a plurality of pairs of pin members extending therefrom;

each of said pinching members comprising a base portion having a pair of openings formed therein and a wall member extending upwardly from said base portion and having said pinching surface formed therein; said pair of openings receiving one of said pairs of pins on said chains; and

a resilient attachment means extending from said base portion for detachably partially embracing said chain to maintain said pinching member on said chain whereby each of said pinching members are independently quickly removable from said loop members.

3,868,748

TENDON GRIPPING AND RELEASE ASSEMBLY

William F. Kelly, 100 Bellaire Dr., New Orleans, La. 70124

Filed June 27, 1973, Ser. No. 374,128

Int. Cl. F16g *11/04*

U.S. Cl. 24—115 M **13 Claims**

1. A gripping and release assembly for steel tendons or the like, including:

a. a casing having a bore extending therethrough,

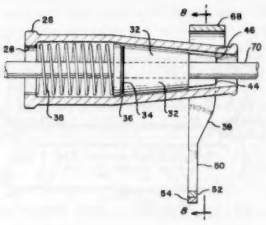
b. wedge means positioned within the bore of said casing, through which the tendon passes,

c. means on said wedge means for effecting gripping engagement with the tendon upon longitudinal movement of said wedge means in one direction within said casing,

d. spring means within said casing for urging said wedge means into gripping engagement within the tendon,

e. release means attached to, and movable transversely with respect to, said casing,

f. a portion of said release means being engageable with a terminal of said wedge means, and



g. means on said release means for selectively forcing longitudinal movement of said wedge means in a direction to release the grip on the tendon upon transverse movement of said release means in one direction and to permit gripping engagement of said wedge means with the tendon upon transverse movement of said release means in the opposite direction.

3,868,749

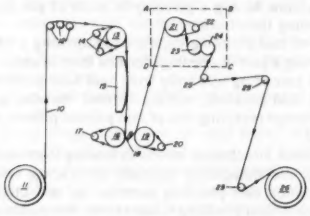
METHOD OF TEXTURIZING THERMOPLASTIC YARN

Alan Clifford Cate, North Madison, Ohio, assignor to American Cyanamid Co., Stamford, Conn.

Filed Feb. 6, 1974, Ser. No. 428,173

Int. Cl. D02g *1/14*

U.S. Cl. 28—72.15 **8 Claims**



1. A process for texturizing untwisted yarn consisting of continuous thermoplastic filaments which comprises: heating the yarn to a temperature above its glass transition temperature but below its sticking temperature; drawing the yarn at such temperature over a sharp edge at an acute angle to induce a strain along one side of each filament length making up said yarn; cooling the yarn thus edge-drawn so as to set the strain and relax the yarn; reheating the yarn to a temperature sufficient to cause crimping while maintaining sufficient tension on the yarn to prevent crimp development from occurring during said reheating, said reheating temperature being below the edge-drawing temperature; immediately releasing the tension on the yarn when it is at the crimping temperature so as to cause the yarn to balloon and the individual filament to retract and develop crimp independently of and thereafter advancing the yarn under sufficient tension to remove temporarily the crimp thus developed.

3,868,750

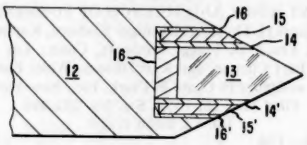
METHOD OF JOINING DIAMOND TO METAL

George S. Ellis, Newark; Thomas E. Kimble, New Castle, and James R. Sawers, Wilmington, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 21, 1974, Ser. No. 453,342

Int. Cl. B26d *1/00*

U.S. Cl. 29—95 R **18 Claims**



13. An article of manufacture comprising a diamond, an alloy selected from the group consisting of gold-tantalum alloys containing from about 1 to about 25% by weight of tantalum, and gold-niobium alloys containing from about 1 to about 10% by weight of niobium; at least one metal blank adhered to said diamond by said alloy; a bonding medium; and a metal shank adhered to said metal blank by said bonding medium.

18. The article of claim **13** wherein at least a portion of said diamond is exposed to form a cutting edge.

3,868,751

CYLINDRICAL ROTOR FOR USE IN A RASPING MACHINE

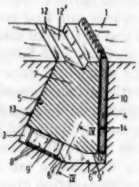
Johannes Jacobus Holthuis, Veendam, Netherlands, assignor to Nederlandese Industrie voor Baggerwerktuigen Nivoba N.V., Veendam, Netherlands

Filed Apr. 10, 1973, Ser. No. 349,769

Claims priority, application Netherlands, Apr. 14, 1972, 7205104

Int. Cl. B26d *1/12*

U.S. Cl. 29—105 R **3 Claims**



1. A cutter assembly for use in rasping machines comprising, in combination:

a cylindrical rotor body adapted to be rotated about its longitudinal axis and having a plurality of longitudinally extending grooves therein, each groove defining a radially extending side face, a supporting face spaced from said face and extending in radially outwardly converging relation toward said side face, and a bottom face having a seating face portion thereof disposed at right angles to said supporting face;

a cutting blade in each recess engaging a corresponding side face and projecting radially outwardly from its groove to perform a cutting action as said body is rotated about its longitudinal axis;

a locking rod associated with each cutting blade, each locking rod having opposite side surfaces disposed at that convergent angle defined between the side and supporting faces of each groove and each locking rod being dimensioned to fit within its groove with one side surface in face-to-face contact with said cutting blade and the

other side surface in face-to-face contact with said supporting surface, each said locking rod also having a bottom surface having a portion disposed in spaced, parallel relation to said seating face portion when its opposite side surfaces are engaged with said cutter blade and said supporting surface so that each locking rod is radially inwardly slidable along its supporting face to retreat from and disengage its cutting blade to permit movement of the cutting blade within the gorrve; and

a flat, undulated spring seated within each groove between said seating face portion and said portion of the bottom surface of the locking rod parallel thereto normally urging each said locking rod in locking engagement with its cutting blade.

3,868,752

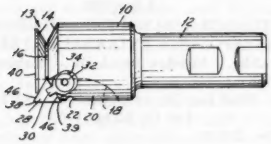
CUTTING TOOL

David Alan Hopkins, Detroit, Mich., assignor to The Valeron Corporation, Detroit, Mich.

Filed Nov. 16, 1973, Ser. No. 416,446

Int. Cl. B26d *1/12*

U.S. Cl. 29—105 A **10 Claims**



1. A cutting tool for indexable polygonal inserts comprising: a shank member having an axis, a circumferential groove at one end of said shank member, said groove having two locating surfaces engaging sides of said insert, and a bottom seat providing means to locate an insert with its cutting face in a negative radial rake plane and its side engagement in and delineating a radial plane containing said axis divergent from said seat in a radially outward direction, and means for securing a cutting insert in operating engagement on said seat.

3,868,753

METHOD FOR ASSEMBLY OF A ROTARY PISTON INTERNAL COMBUSTION ENGINE

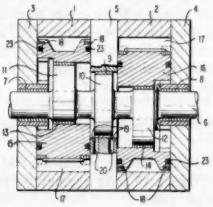
Willi Springer, Faurndau, and Walter Bellmann, Esslingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Jan. 30, 1973, Ser. No. 327,950

Claims priority, application Germany, Jan. 31, 1972, 2204341

Int. Cl. B23p *15/00*

U.S. Cl. 29—156.4 R **5 Claims**



1. A method for the assembly of a rotary piston internal combustion engine which comprises a housing composed of two casing parts, of two end parts and of an undivided intermediate part, and two pistons which rotate on two eccentrics of an undivided eccentric shaft which includes a bearing pin intermediate the two eccentrics that is adapted to be supported in a bearing of the undivided intermediate part, the inner diameter of the bearing being larger than the diameter of an eccentric and the width of the intermediate parts being larger than the intermediate spacing between the bearing pin and each of the two eccentrics, comprising the steps of causing relative movement between the intermediate part and the eccentric shaft such that the intermediate part with inserted bearing is in effect moved axially to the eccentric shaft over an eccentric thereof until it abuts at the side of the bearing pin facing the intermediate part over a part of the circumference thereof with an area of the circumference thereof not abutting the bearing pin lyihg within an area over the eccentric, thereupon causing relative pivotal movement between the intermediate part and the eccentric shaft in such a manner that the intermediate part, with the area of its circumference not abutting at the bearing pin, comes to lie over the bearing pin and no longer lies within the area over the eccentric, thereupon causing radial displacement between the intermediate part and the eccentric shaft in such a manner that the intermediate part is displaced in effect radially with a simultaneous back pivoting until the positions of the center longitudinal axes of the bearing and of the bearing pin differ only slightly from one another, and thereafter completing the installation by causing relative movement between the intermediate part and the eccentric shaft in such a manner that the intermediate part is displaced in effect over the bearing pin under simultaneous complete pivoting back into its original position.

3,868,754

METHOD OF MANUFACTURING A FINNED-TUBE HEAT EXCHANGER

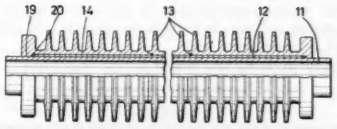
Hatsuo Kawano, No. 3330, Kagata, Kawachinagano-shi, Osaka-fu, Japan

Filed Dec. 14, 1973, Ser. No. 424,722

Claims priority, application Japan, Sept. 21, 1973, 48-10763

Int. Cl. B21d *53/02*; **B23p** *15/26*

U.S. Cl. 29—157.3 A **2 Claims**



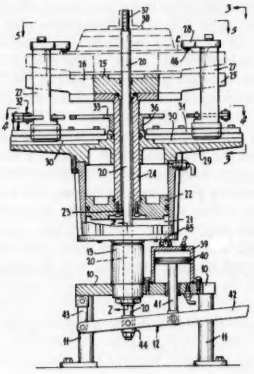
1. A method for manufacturing a finned tube as a heat exchanger comprising the steps of: providing as an inner tube a tube which is made of steel; covering said inner tube with a thin-walled pipe made of aluminum having the properties of softness, high heating expansion coefficient and good thermal conductivity; fitting thereonto a cylindrical outer tube on which fins are arranged, both the cylindrical outer tube and the fins being made of cast iron; and internally expanding the inner tube by cold working so as to adhesively contact the thin-walled pipe with the inner tube which in turn then contacts the outer cylindrical member.

3,868,755

MACHINE FOR RECONDITIONING AND SETTING DIAPHRAGM TYPE AND LEVER TYPE CLUTCHES

Grigore Tongurian, 1/35 Pearson St., Gladesville, New South Wales, Australia

Filed Aug. 27, 1973, Ser. No. 391,123
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 J **2 Claims**



1. A machine for reconditioning and setting clutches comprising
- a base,
- a fluid pressure cylinder rotatably mounted on said base,
- a top cover secured to said cylinder,
- a piston mounted in said cylinder,
- a sleeve extending upwardly from the piston through said top cover for reciprocation between upper and lower positions in response to changes in the pressure within said cylinder,
- a shaft extending through the piston and sleeve,
- a table for supporting a clutch, said table being rotatably mounted with respect to said shaft and supported by said sleeve,
- a clamping member on said shaft above said top cover for holding a clutch between said clamping member and table when said table is in its upper position,
- clamping columns mounted on said top cover for radial sliding movement on said top cover in slots in said table, a spider having a plurality of arms and rotatably mounted on said sleeve beneath said table,
- linkage means connecting each spider arm to one of said clamping columns to radially reciprocate said columns as said spider rotates, and
- means for rotating said spider.

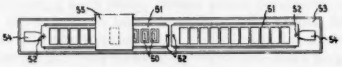
3,868,756

METHOD FOR PRODUCING IDENTICAL FLAT CARRIERS HAVING REPRESENTATIONS THEREON

Bruno Zumbach, Orpund, Switzerland, assignor to Zumbach Electronic-Automatic, Berne, Switzerland

Filed Aug. 27, 1971, Ser. No. 176,767
Claims priority, application Germany, Aug. 31, 1970, 2043121
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 **12 Claims**

1. A method of producing identical flat carriers having each an identical representation thereon, comprising providing reproducing means and a reproduction method wherein a sheet of flat material remains in a predetermined position fixed to supporting means while a number of representations are applied to said flat sheet each in a predetermined position with reference to reference marks common to all representations applied to the sheet by means of said reproducing means controlled from position to position according to a predetermined position control, and a separating method for cutting out of separate flat carriers having each a representation wherein a sheet of flat material previously prepared and carrying representations is applied to a support in a predetermined



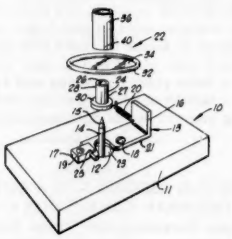
position relatively to said reference marks and to a cutting tool respectively, whereafter all positions adjusted during the reproduction method are again adjusted one after the other according to a predetermined position control in order to bring each of said representations into a position relatively to the cutting tool for cutting out a flat carrier having a representation.

3,868,757

APPARATUS FOR ASSEMBLING AND DISASSEMBLING A DISPOSABLE EXTERNAL CATHETER

Toma O. Abbo, 1 Meadow Brook Dr., Oklahoma City, Okla. 72205

Filed July 26, 1973, Ser. No. 382,732
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 H **4 Claims**

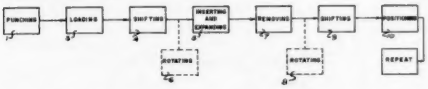


1. An apparatus for assembling and disassembling a disposable external catheter used for tapping urinary discharge wherein the catheter includes a hollow cylindrical connector having an annular flange on the lower portion thereof, a prophylactic having the closed end punctured, and a drain hose, the upper portion of said connector and the closed end of said prophylactic being frictionally secured to one end of said drain hose which is comprised of:
- a base;
- an upstanding pointed post having the lower end secured to said base;
- a recess in said base having a diameter at least as large as the annular flange of said connector for receiving said annular flange; and
- a locking device secured to said base adjacent to said recess so that the annular flange of said connector can be held in a fixed position inside said recess by said locking device.

3,868,758
METHOD FOR CELL PLATE ASSEMBLY

Lawrance W. Wightman, St. Louis, and Howard C. Gebhart, Chesterfield, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 26, 1973, Ser. No. 327,018
Int. Cl. B23p *11/00*
U.S. Cl. 29—430 **10 Claims**

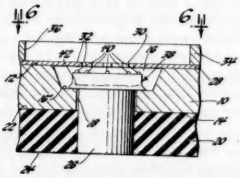


1. A method for automated cell plate assembly comprising the steps of:
   - punching a plurality of plates including punching at least one small diameter opening and one large diameter opening in individual ones of said plate plurality;
   - arranging said plates on a conveyor means so that alternate successive plates are rotated 180° with respect to one another;
   - feeding said plates into one of at least two fixtures, each of said fixtures including a multiplicity of receptacle means for receiving and holding said plates, at least two of said successive plates forming a pair, said individual pairs being positioned in one of said receptacle means, successive ones of said pairs being selectively spaced apart by said fixture;
   - coordinating said punching step with said two fixtures such that a first fixture is loaded with plates from said punching, arranging and feeding steps, while said second fixture has the following steps accomplished on it;
     - inserting at least one pair of tubular structures through said opening pair in said plates, expanding said tubular structures so as to mount alternate plates to alternate ones of said tubular structures, thereby forming an integral cell unit; and
   - removing said cell unit from said fixture.

3,868,759
MAGNETIC PRE-ALIGNMENT OF SEMICONDUCTOR DEVICE CHIPS FOR BONDING

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1973, Ser. No. 414,272
Int. Cl. B23q *3/18*
U.S. Cl. 29—464 **3 Claims**

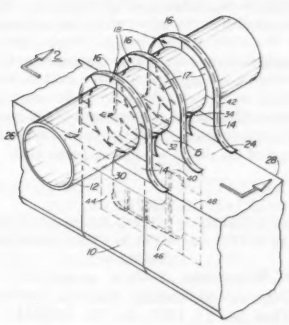


3. A method of prealigning integrally leaded semiconductor device chips with conductive lead frame structures to promote a consistent precise subsequent engagement therebetween for bonding, said method comprising the steps of:
   - placing a semiconductor device chip having a plurality of soft ferromagnetic integral leads on one face thereof into each of a plurality of recesses in one surface of a template, with said chip face oriented upwardly;
   - positioning a conductive lead frame structure having sets of soft ferromagnetic fingers corresponding to the integral chip leads on said one template surface so that a set of lead frame fingers overlie each of the template recesses;
   - placing a magnetic plate contiguous and coextensive with the backside of said template, said plate being a permanent magnet with the major faces of the plate serving as opposite poles of the magnet;
   - holding said template, said lead frame, and said magnetic plate together in mutual registration to form a subassembly;
   - vibrating said subassembly for a short period of time so that all of said chips are automatically prealigned, with the integral chip leads being in close proximity with their corresponding lead frame fingers; and
   - transporting said subassembly to a bonding station without disturbing said prealignment, said prealignment promoting a consistent precision engagement after the chips have been magnetically transferred and oriented into engagement with the lead frame fingers for bonding thereto.

3,868,760
METHOD OF ORTHOGONALLY CONNECTING LONG STRUCTURAL MEMBERS OF CIRCULAR AND RECTANGULAR CROSS-SECTION

Mehmet D. Korkut, 3848 Veterans Hwy., New Orleans, La. 70002

Filed Sept. 7, 1973, Ser. No. 395,211
Int. Cl. B23k
U.S. Cl. 29—470 **3 Claims**



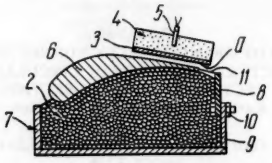
1. The method of orthogonally connecting two longitudinal hollow structural members comprising the steps of:
   - a. framing one of said members with interior orthogonally connected trusses, said framing extending longitudinally and transversely therein for the length and width of a connection, said trusses being secured in said one member as a part thereof;
   - b. Fastening, respectively, external flanges to said longitudinally extending framing to project parallel and outwardly from said one member in transversely spaced apart alignment, said flanges respectively defining center indentations having a common axis transverse said one member, said center indentations being adapted to conform to the external cross-sectional shape of the other of said members;
   - c. Placing said other member in said indentations with its place of connection extending therein, thereby placing said other member in normal or orthogonal juxtaposition with said one member; and
   - d. Assembling and fixing peripheral segments together and to said respective external flanges to externally frame said other member and connect it with said one member orthogonally or at right angles therewith.

3,868,761

METHOD OF CLADDING OF METAL PRODUCTS

Jury Ignatievich Apalikov, prospekt Lenina, 96, kv. 44; Leonid Leonidovich Bankovsky, ulitsa Isakova, 141, kv. 55, both of Barnaul; Alexandr Shmulievich Gelman, 3-ya Tverskaya-Yamskaya, 42/8, kv. 46, Moscow; Jury Alexeevich Konon, ulitsa Novaya, 6, kv. 41, Barnaul; Leonid Borisovich Pervukhin, ulitsa Jurina, 116, kv. 40, Barnaul; Boris Davydovich Tsemakhovich, prospekt Lenina, 69, kv. 41, Barnaul; Grigory Abramovich Bronovsky, ulitsa 7-ya Sovetskaya, 7, kv. 6; Vitaly Moiseevich Poretskin, prospekt Zanevsky, 28, kv. 201, both of Leningrad; Petr Pavlovich Tokarev, ulitsa Burjuzova, 8, kv. 47, Odintsovo, Moskovskoi oblasti, all of U.S.S.R., and Boris Agafonovich Barinov, deceased, late of prospekt Lenina, 63a, kv. 6, Barnaul, U.S.S.R. (by Raisa Alexeevna Alinina, administrator)

Filed Mar. 22, 1973, Ser. No. 344,028
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 5 Claims



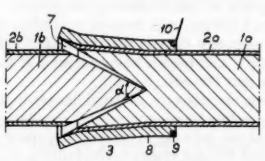
1. In a method of cladding metal products, wherein the workpiece being clad is placed on a support and subjected to cladding by the explosive-welding technique, the improvement which comprises the steps of providing a "pad" of metallic shot with which the workpiece being clad makes a direct physical contact so as to be the support for accommodating the workpiece; and selecting the material of the metallic shot having physico-mechanical characteristics substantially close to the material of the metal workpiece being clad.

3,868,762

METHOD OF JOINING WIRE OR RODS OF COMPOUND MATERIAL WITH ALUMINUM CORE AND COPPER CASING

Jan Nilsson, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jan. 13, 1972, Ser. No. 217,512
Claims priority, application Sweden, Jan. 29, 1971, 1073/71; Mar. 11, 1971, 3106/71
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 9 Claims



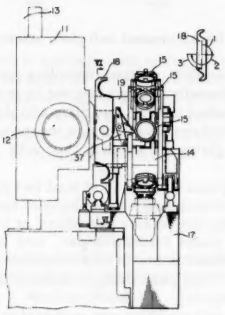
1. Method of joining wire of compound material having a core of aluminium and a casing of copper, which comprises shaping two ends of said wire to be joined to form male and female parts, inserting the male part so far in the female part that the inner surface of the casing of the female part partly covers the unpointed, unshaped part of the casing of the male part, applying a sleeve of explosive around the joint and detonating it so that the core and casing of one wire end are joined to the core and casing of the other wire end in one operation by means of explosion welding.

3,868,763

AUTOMATIC TOOL EXCHANGING APPARATUS

Mitsuharu Sato, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 29, 1972, Ser. No. 319,711
Claims priority, application Japan, Jan. 7, 1972, 47-4538
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 3 Claims

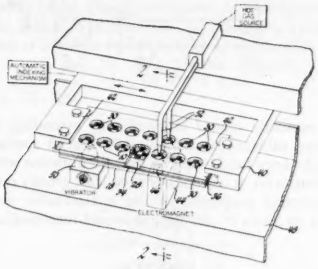


1. In an automatic tool exchanging apparatus for use in combination with a machine tool of the class having a tool carrying spindle for performing machining operations a plurality of key shaped tool code members, each tool code member formed with a tool code corresponding to a given tool, a tool storage magazine including a plurality of tool pots, each adapted to removably receive one tool and one tool code member, means to read the code of a tool code member in a given tool pot and operatively positioned for indexing said tool storage magazine to a tool exchanging position in accordance with the code of a tool code member in a given tool pot, and a tool exchanging arm positioned on said machine and adapted to exchange a tool mounted on the spindle of said machine tool and a tool in said given tool pot at said tool exchanging position, the improvement wherein each of said tool pots includes a cylindrical housing and a sleeve positioned within said cylindrical housing so as to be movable in the axial direction with respect to said cylindrical housing, said sleeve having an opening adapted to receive the shank of a tool and an axial groove on its outer surface for receiving therein a tool code member, tool code member exchanging means positioned coaxial with said sleeve and having two diametrically opposite tool code member receiving groove, means for rotating said tool code member exchanging means connected thereto about said housing cylinder axis for bringing a selected one of the tool code receiving grooves into axial alignment with the groove of said sleeve, means connected to said tool code member exchanging means for reciprocating said tool code member exchanging means toward and away from said given tool pot for exchanging tool code members therebetween, and means operatively positioned for interlocking said tool code member exchanging means with said tool exchanging arm for replacing said tool code member corresponding to the tool in said given tool pot for said tool code member corresponding to said tool on said spindle.

3,868,764
MULTIPLE MAGNETIC ALIGNMENT OF SEMICONDUCTOR DEVICES FOR BONDING

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1973, Ser. No. 414,273
Int. Cl. B23k 5/00; H01l 7/00
U.S. Cl. 29—589 **4 Claims**



1. A self-aligning method of automatically transferring integrally leaded semiconductor device chips to a conductive lead frame structure for permanently bonding thereto, said method comprising:

placing a semiconductor device chip having a face with a plurality of soft ferromagnetic integral leads thereon into a recess in one surface of a template so that said chip face is oriented upwardly, said recess having a bottom portion substantially parallel to said one template surface, said template having a core of soft ferromagnetic material extending from said recess bottom portion to an opposite surface of the template;

positioning a conductive lead frame structure having a soft ferromagnetic convergent cantilevered finger set over said template so that said fingers are spaced above in closely spaced relation with the chip in the template recess;

applying a magnetic force generally perpendicular to the underside of said core to precisely align said integral chip leads with corresponding fingers of said lead frame and to concurrently magnetically raise the chip from the template recess up to said fingers to produce a precisely aligned engagement between all of the integral chip leads and their corresponding fingers; and

bonding said integral chip leads to said lead frame fingers while the magnetic force is still applied.

3,868,765
LAMINATED TEMPLATE FOR SEMICONDUCTOR DEVICE BONDING

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

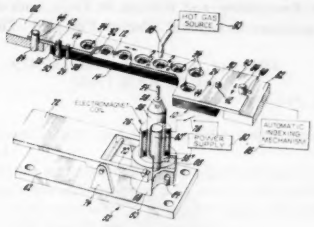
Filed Nov. 9, 1973, Ser. No. 414,501
Int. Cl. B23k 5/00; H01l 7/00
U.S. Cl. 29—589 **2 Claims**

1. A self-aligning method of automatically transferring integrally leaded semiconductor device chips to conductive lead frame structures for bonding thereto, said method comprising:

placing a semiconductor device chip having a face with a plurality of soft ferromagnetic integral leads thereon into a recess in one surface of a template so that said chip face is oriented upwardly, said template recess having a bottom portion which is substantially parallel to said one template surface, said template having an opening extending through the recess bottom portion to an opposite surface of the template;

positioning a conductive lead frame having at least one set of soft ferromagnetic fingers corresponding to said integral chip leads on the one template surface so that said finger set is in accurately spaced general alignment with the chip in the template recess;

applying a magnetic force to one end of a soft ferromagnetic probe so that magnetic lines of flux flow longitudinally therethrough;



extending said probe through the template opening to engage the back side of the chip within the template recess and raise the chip closer to the overlying set of lead frame fingers until the magnetic force transmitted through the probe precisely aligns the integral chip leads with their corresponding fingers and concurrently magnetically raises the chip from the probe up to the fingers to produce engagement between all of the integral chip leads and their corresponding fingers;

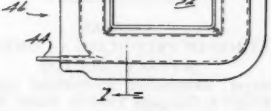
heating said integral chip leads and said fingers in engagement therewith to permanently bond said chip to said lead frame finger sets, and

terminating application of said magnetic force.

3,868,766
METHOD OF FORMING AN INSULATED COIL FOR A DYNAMOELECTRIC MACHINE

Donald L. Gramlich, Belleville; Ormond J. Jedele, Pinckney, and Robert M. Pearson, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 31, 1973, Ser. No. 393,700
Int. Cl. H01f 7/06
U.S. Cl. 29—596 **7 Claims**



1. A method of forming an insulated electrical coil formed of a number of turns of a conductive member, the conductive member having a width dimension generally perpendicular to the plane of the coil and a thickness dimension generally in the plane of the coil, comprising the steps of:

associating a single layer of insulating paper with a single layer of the conductive member in such a manner that the paper covers a surface of the conductive member having a width dimension to form paper-covered conductive member;

coiling a finite length of said paper-covered conductive member into a coil form in which said paper layer is interposed between adjacent layers of the conductive member;

pre-cutting a pair of insulating paper sheets to provide sheets having dimensions which overlie the coil in each direction; and

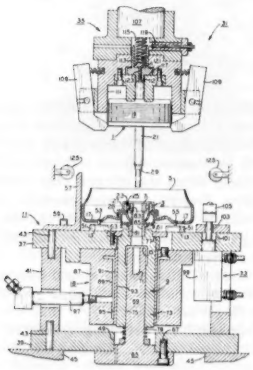
inserting the coil form between the sheets and uniting the sheets about the coil form to provide toroidal encapsulation.

3,868,767

METHOD AND APPARATUS FOR ASSEMBLING COMPONENTS FOR A DYNAMOELECTRIC MACHINE

John M. Brunschwig, and William M. Stone, both of De Kalb, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 1, 1974, Ser. No. 456,479
Int. Cl. H02k *15/04*
U.S. Cl. 29—598 **37 Claims**



1. A method of assembling a rotatable member with a bearing means mounted to a structural component for a dynamoelectric machine comprising the steps of:

a. disposing only an inner race of the bearing means generally coaxially of and in engagement with means for supporting it; and

b. press-fitting the rotatable member through the inner race of the bearing means while transmitting the force of the press-fitting only to the supporting means and isolating all other anti-friction components of the bearing means from the force of the press-fitting.

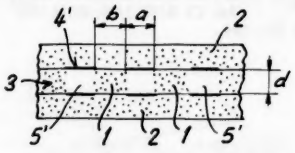
3,868,768

METHOD OF PRODUCING A COMPOSITE SUPERCONDUCTOR

Gundolf Meyer, Birmenstorf, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 22, 1973, Ser. No. 362,776
Claims priority, application Switzerland, May 31, 1972, 8079/72
Int. Cl. H01v *11/14*
U.S. Cl. 29—599 **13 Claims**

1. In the method for producing electrical super-conductors consisting of a great number of mutually spaced thin filaments of an intermetallic super-conductive compound by diffusion of a first metallic material from each of two outer layers of a three-layer metallic structure into a second metallic material of the intermediate layer therebetween, the improvements which comprise the steps of arranging at the interfaces between opposite faces of said intermediate layer and the adjoining faces of said two outer layers mutually spaced zones of a foreign substance extending in the longitudinal direction of the to be produced super-conductors, mechanically working the three-layer metallic structure as a unit to establish a metallurgically intimate connection between said layers, and subjecting the connected layers to a thermal treatment to effect the desired diffusion from said outer layers into said intermediate layer in mutually spaced longitudinally extending zones,



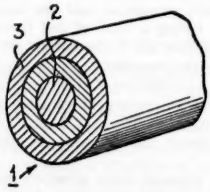
between mutually spaced longitudinally extending zones of said foreign substances said mutually spaced zones of said foreign substance functioning to prevent diffusion within said intermediate layer at its zones or to at least greatly reduce the superconductive properties of the intermetallic compound formed at its zones by diffusing into said intermediate layer.

3,868,769

METHOD OF MAKING SUPERCONDUCTORS

Jean Dosdat; Jacques Lanthiez, and Claude Levaire, all of Chauny, France, assignors to Compagnie Francaise Thomson Houston-Hotchkiss Brandt, Paris, France

Continuation of Ser. No. 216,525, Jan. 10, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 396,794
Claims priority, application France, Jan. 8, 1971, 71.00518
Int. Cl. H01v *11/08*
U.S. Cl. 29—599 **4 Claims**



1. A method of making a stabilized transposed multifil superconductor made of an intermetallic superconductor composition crystallizing according to the crystalline structure A 15, comprising the following steps:

A. forming a monofil stock product having a core comprising one element of the intermetallic superconductor composition to be obtained, said core being coated with another element of said composition, and a first jacket surrounding said core, said first jacket being made of a ductile material having good heat and electric conductivity,

B. wiredrawing said monofil stock product to a desired diameter to obtain a wiredrawn monofil product wherein said jacket is in close engagement with said core,

C. forming a transposed multifil stock product having, as its interior element, a plurality of said wiredrawn monofil products and, as its exterior element, a second jacket surrounding said interior element, said second jacket being made of ductile material having good heat and electric conductivity,

D. wiredrawing said transposed multifil stock product to a desired diameter to obtain a wiredrawn transposed multiful product wherein said first and second jackets form a homogeneous mass serving as a stabilizing jacket for the transposed multiful superconductor to be obtained and in which the cores are individually embedded, and

E. submitting said wiredrawn transposed multiful product to a heat treatment of a duration of from 5 minutes to 20 hours at a temperature between 600° C and 1300° C to effect an in-place diffusion reaction of the core material for transforming the latter into said intermetallic superconductive composition.

3,868,770

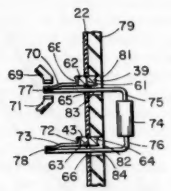
WELDED INTERCONNECTION PRINTED CIRCUIT BOARD AND METHOD OF MAKING SAME

Herbert T. Davis, Tempe, and James B. Reid, Phoenix, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Division of Ser. No. 249,044, May 1, 1972,. This application July 23, 1973, Ser. No. 381,826

Int. Cl. H05k *3/32*

U.S. Cl. 29—626 **19 Claims**



1. The method of making a printed circuit interconnect board comprising in combination the steps of:

providing first and second resistance weldable metallic film layers;

providing a dielectric layer impregnated with a thermosetting adhesive;

preforming a series of holes in said dielectric at points wherein weld-through connections are to be made;

disposing said first and second metallic film layers on opposite sides of said dielectric layer;

resistance welding said first metallic film layer to said second metallic film layer to form said weld-through connections in said series of holes in said dielectric layer to form a sandwich;

subsequently applying temperature and pressure for a predetermined time to said sandwich causing said thermosetting adhesive to flow into and fill said holes in said dielectric layer and surround said weld-through connections within said holes and to cure the impregnated adhesive in said dielectric layer for laminating said first and said second metallic film layers to said dielectric layer; and

masking and etching both sides of said laminate according to a predetermined pattern to form conducting metallic strips on both sides of said dielectric layer.

3,868,771

JOINTING METAL CABLE SHEATHS

Graham John Smee, Gravesend, and Anthony Owen Miller, Fawkham, both of England, assignors to British Insulated Callander's Cables Limited, London, England

Filed May 4, 1973, Ser. No. 357,679

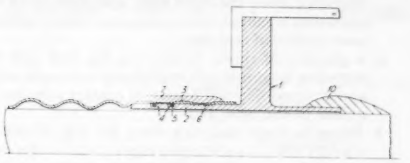
Claims priority, application Great Britain, May 8, 1972, 21407/72

Int. Cl. H01r *43/00*

U.S. Cl. 29—628 **7 Claims**

1. A method of sealing an end of an electric cable having at least one core and a surrounding metallic sheath to an end portion of an enclosure into which said end extends comprising:

a. shaping a length of said metal sheet adjacent an end thereof to space it from said core and forming a concentric assembly comprising said length of the sheath, a first metallic tubular member, a second metallic tubular member and an elastomeric sealing ring, said length of the sheath lying radially between said first metallic tubular member and said second metallic member, said elastomeric sealing ring lying radially between said first metallic tubular member and said length of the sheath, at least a part of the surface of said first metallic tubular member



contiguous with said length of the sheath being roughened;

b. and after said assembly is formed permanently circumferentially inwardly compressing same until a substantially fluid-tight joint is formed between said metal sheath and said first metallic tubular member.

3,868,772

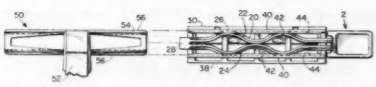
RAZOR CARTRIDGE AND ADAPTER ASSEMBLY

Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 294,482, Oct. 2, 1972, abandoned. This application Jan. 30, 1974, Ser. No. 437,733

Int. Cl. B26b *21/40*

U.S. Cl. 30—34 R **9 Claims**



1. A razor cartridge assembly comprising, in combination, a razor cartridge and an adapter, said razor cartridge comprising a rigid platform member, a rigid cap member joined to said platform member, blade means fixedly disposed between said platform member and said cap member, a pair of elongated parallel rails extending from said cartridge and having inturned flanges at their free edges to form opposed parallel grooves, said adapter comprising a grip portion and a sabre portion extending from said grip portion, said sabre portion in its substantial entirety consisting of compressible wire-like means in engagement with interior portions of said parallel grooves, said cartridge being supported solely by said wire-like means.

3,868,773

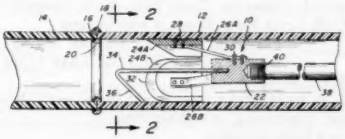
BEAD REMOVAL TOOL

William F. Province, Bartlesville, Okla., assignor to Emerson Electric Company, St. Louis, Mo.

Filed Dec. 17, 1973, Ser. No. 425,156

Int. Cl. B23d *9/00*; **B29c** *17/10*

U.S. Cl. 30—130 **7 Claims**



1. A bead removal tool for removing the inner bead formed

while joining lengths of plastic pipe by heating the opposed ends and pressing them together, comprising:

a. an axial hub;

b. A plurality of blades, each formed as portions of a cylindrical wall to approximately fit the interior surface of said pipe, the leading edges of said blades being shaped and sharpened along the outer edge, said plurality of blades positioned in substantially contiguous relation around the inner surface of said pipe;

c. a plurality of spring means, one for each said blade, extending from said hub individually and resiliently outwardly supporting said blades, in contact with the inside surface of said pipe; and

d. means to force said hub along the axis of said pipe, whereby when the sharpened edges of said blades contact an inner bead, said bead will be sheared off by said plurality of blades.

3,868,774

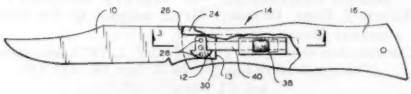
FOLDING BLADE KNIFE WITH BLADE LOCK

Nilo M. Miori, Solvay, N.Y., assignor to Camillus Cutlery Company, Camillus, N.Y.

Filed Sept. 12, 1973, Ser. No. 396,867

Int. Cl. B26b *1/04*

U.S. Cl. 30—161 **11 Claims**



1. A folding blade knife construction with blade locking means, said construction comprising, in combination:

a. a blade including a tang and a shoulder on the back edge;

b. means pivotally mounting said blade for movement between open and closed positions;

c. a handle having an outer cover and a two-piece liner defining a space therebetween for accepting said blade in its folded position;

d. manually engageable button extending through an opening in said handle cover and mounted for sliding movement longitudinally along said handle;

e. a leaf spring mounted between the pieces of said liner and having a deflectable end adjacent said tang for engagement therewith to bias said blade toward either of said open and closed positions, said open position being defined by engagement of said shoulder with said deflectable end;

f. an element affixed to and extending laterally outward from said tang and movable therewith; and

g. a locking member connected to said button and movable therewith between a locking position, wherein a portion of said locking member extends into the path of movement of said element when said blade is in said open position to prevent movement to the closed position, and an unlocking position, wherein said locking member is out of the path of movement of said elements.

3,868,775

SHOVEL MOUNTED WEED CUTTER

Robert L. Anderson, Great Falls, Mont., assignor to James R. Paul, Great Falls, Mont., a part interest

Filed Aug. 13, 1973, Ser. No. 387,654

Int. Cl. A01b *1/02*, *1/22*; A01d *11/00*

U.S. Cl. 30—329 **6 Claims**

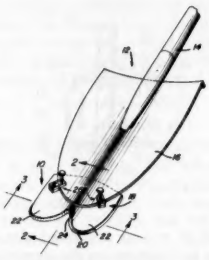
1. A weed cutter attachment for a round-headed shovel blade, comprising, in combination:

a. a body member;

b. blade means provided on the body member for cutting vegetation, the blade means including a bifurcated cutting surface formed on an edge of the body member and divided into two parts, each bifurcated part of the cutting surface being arcuate in plan and cooperatively meeting with the other part to form a substantially V-shaped recess; and

c. means mounted on the body member for attaching same to a round-headed shovel blade, the means for attaching including a pair of L-shaped clamp members, each clamp member mounted on a common surface of the body member and having a one leg arranged spaced from and parallel to the common surface, and spaced from the other clamp member, and means cooperating with the one leg for selectively, retentively engaging a round-headed shovel blade and clamping the attachment onto the shovel blade.

3. In combination with a shovel having a shovel blade, a weed cutter attachment, comprising, in combination:



a. a body member;

b. blade means provided on the body member for cutting vegetation, the blade means including a bifurcated cutting surface formed on an edge of the body member and divided into two parts, each bifurcated part of the cutting surface being arcuate in plan and cooperatively meeting with the other part to form a substantially V-shaped recess; and

c. means provided on the blade means for attaching same to the shovel blade, the shovel blade being a round-headed shovel blade the means for attaching including a pair of L-shaped clamp members, each clamp member mounted on a common surface of the body member and having a one leg arranged spaced from and parallel to the common surface, and spaced from the other clamp member, and means cooperating with the one leg for selectively, retentively engaging the round-headed shovel blade and clamping the attachment onto the shovel blade.

3,868,776

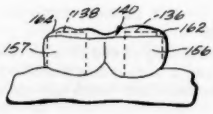
REMOVABLE DENTAL BRIDGE AND METHOD FOR MAKING SAME

Mervyn C. Lasky, 1535 N. Poinsettia Pl., Hollywood, Calif. 90046

Continuation-in-part of Ser. No. 334,729, Feb. 22, 1973,. This application June 26, 1974, Ser. No. 483,164

Int. Cl. A61c *13/22*

U.S. Cl. 32—5 **10 Claims**



1. A patient-removable dental bridge system for removably mounting a pontic, the system comprising

a male supporting member affixed to an abutment tooth to serve as a bridge support,

the male member being a solid piece extending mesio-distally from the abutment tooth for about one-half the width of the pontic,

the male member having a pair of spaced apart, upright first and second edges which extend occluso-gingivally for a major portion of the height of the pontic, and a top edge extending mesio-distally between the first and second edges of the male member,

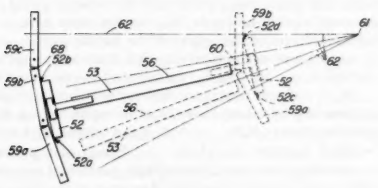
the top edge having a first portion extending from the first upright edge toward the second upright edge and traversing a major portion of the width of the male member, and a second portion which is recessed to form a relatively shallow notch in the top edge of the male member adjacent the abutment tooth, the depth of the notch extending for a minor portion of the height of the male member, and a female member rigidly secured to the pontic, the female member comprising a socket member shaped to be releasably mounted on the male member, the socket member providing spaced apart lingual and facial surfaces to be releasably engaged with opposite sides of the male member, and an occlusal cap shaped to be fitted on the top of the socket member, the occlusal cap including a bridge piece shaped to match the size and shape of the notch in the male member, the bridge piece being positioned relative to the male member to make a tight fit in the notch of the male member when the female member is mounted on the male member so the bridge piece and notch cooperate to prevent relative movement mesio-distally and occluso-gingivally between the pontic and the male member.

3,868,777

PERSPECTIVE LINE GENERATOR

Franklin D. Bell, P.O. Box 14, Eatontown, N.J. 07724

Filed Feb. 2, 1973, Ser. No. 329,132
Int. Cl. B43l *13/14*
U.S. Cl. 33—77 **7 Claims**



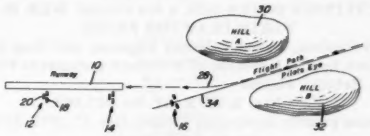
1. A perspective line generator comprising a guide of articulatable chordal segments of equal length used in conjunction with a drawing arm attached to a transverse chordal head, said head having identical dimensions to those of said segments, a contiguous plurality of said articulatable chordal segments forming a smooth continuous guide edge, said guide and said drawing arm cooperating to produce converging lines when the head of said arm is placed at various points of contact with said continuous guide edge when said chordal segments are articulated to positions other than in a straight line, means for articulating said segments to each other to form said continuous guide edge and wherein said means comprises a flexible membrane attached to said segments to form part of said continuous guide edge.

3,868,778

VISUAL APPROACH AND LANDING SYSTEM FOR AIRCRAFT

William O. Collins, 6258 N. Kensington St., McLean, Va. 22101

Filed June 14, 1973, Ser. No. 369,929
Int. Cl. B64f *1/18*
U.S. Cl. 33—227 **11 Claims**



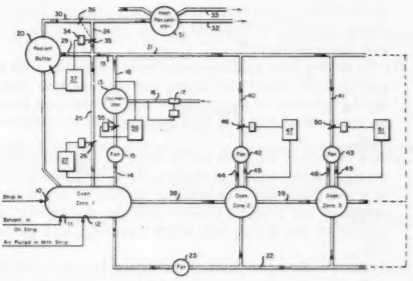
7. In combination with a runway, a landing guidance system including at least two direct viewing indicator devices mounted on the ground adjacent the runway for sequentially signifying initial approach to the runway and touchdown approach to the ground, each of said indicator devices including at least two horizontally aligned lateral bars, a central bar disposed in parallel spaced relation to said lateral bars in such a manner that said central bar is visually aligned horizontally between and closely spaced from the two lateral bars when approaching along a proper flight path.

3,868,779

INCINERATION CONTROL

Charles R. Wilt, Jr., and Floyd L. Schauermann, both of Pittsburgh, Pa., assignors to Salem Corporation, Pittsburgh, Pa.

Filed Sept. 13, 1973, Ser. No. 396,668
Int. Cl. F26b *21/06*
U.S. Cl. 34—54 **10 Claims**



1. In a drying oven of the type having at least one zone in which solvents are evaporated during the drying process and exhausted with other gases to an incinerator for incineration, the improvement which comprises:

a. means providing a constant rate of supply of fuel to the incinerator,

b. means regulating the temperature of the gases emitted from the oven during the drying process to a constant value, and

c. means controlling the quantity of air admitted to the oven as a diluent for the solvents in accordance with the variation of the temperature of the gases constituting the products of combustion of the incinerator exhausted therefrom.

9. In a drying oven according to claim **8**, wherein conduit means is provided for recirculating back to the oven a portion of the products of combustion of the incinerator, and wherein the temperature regulating means of clause (b) comprises valve means in said conduit means and thermally-responsive means exposed to the gaseous stream emitted from the oven

which controls the operation of said valve means to so regulate the quantity of products of combustion of the incinerator admitted to the oven as a diluent for the combustible materials therein so as to regulate to a substantially constant value the temperature of the gaseous stream emitted from the oven.

3,868,780

GROUP OF DRYING CYLINDERS IN A MULTIPLE CYLINDER DRYER FOR A MATERIAL WEB, IN PARTICULAR FOR PAPER

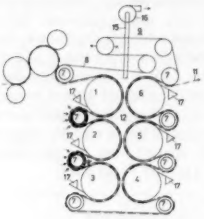
Mauri Soininen, Naantali; Martti Koponen, and Vesa Holopainen, both of Jyvaskyla, all of Finland, assignors to Valmet Oy, Helsinki, Finland

Filed Nov. 2, 1973, Ser. No. 412,463

Claims priority, application Finland, Nov. 13, 1972, 3174/72

Int. Cl. F26b *13/08*

U.S. Cl. 34—116 **7 Claims**



1. In a multiple cylinder dryer for web material, a drying cylinder group, comprising in combination

a plurality of heatable drying cylinders arranged to be rotatable about their horizontal axis.

guiding rolls between consecutive drying cylinders,

an endless drying belt permeable to air, which is common to all drying cylinders of the group, zigzagging from one drying cylinder to the next drying cylinder in the group over the guiding roll,

for the drying belt, guiding means which together with said guiding rolls direct the drying belt to travel so that all drying cylinders of the group lie outside the loop formed by the endless belt and said guiding rolls lie inside said loop,

means by which the web to be dried is directed into the drying cylinder group so that on the drying cylinders the web will travel between a sector surface of considerable extent of the drying cylinders and the drying belt, and outisde of the drying belt when traversing said guilding rolls,

and wherein the open sides of the drying belt are closed by walls in order to produce a closed space inside of the drying belt, and that in said closed space a vacuum has been arranged to act in order that the web when traversing upon the drying belt is attached to the same by suction,

the entire combination being so arranged that the drying belt together with the web travels, with mutual contact between the two, the whole distance from one drying cylinder to the next drying cylinder group.

3,868,781

POLYGNOMONIC MAP OF THE WORLD COMPRISING TWO HEMISPHERES

Jean Thorel, 23, Rue des Volontaires, Paris, France

Filed Apr. 11, 1974, Ser. No. 460,011

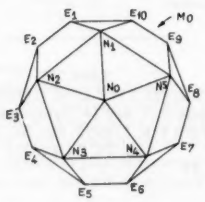
Claims priority, application France, Apr. 27, 1973, 73.15594

Int. Cl. G09b *29/02*

U.S. Cl. 35—42 **2 Claims**

1. An assembly of six maps of the world or other spherical body, obtained from a polygnomonic map of the world or other spherical body, which consists of a regular icosahedron of which the twenty triangular sides carry a tracing of the elements of a globe of same centre as said icosahedron, said centre being that of the polygnomonic projection of said tracing on the icosahedron of which two vertices are advantageously coincident with the poles of the globe concerned and on whose respective sides all the major circles of said globe are represented in the form of segments of straight lines, characterised in that said six maps (M_0, M_1, M_2, M_3, M_4 and M_5) comprise each the representation of two opposite hemispheres, said six maps corresponding to the six vertices, respectively, of the first-projection icosahedron (N_0, N_1, N_2, N_3, N_4 and N_5) and to the six diametrally opposite vertices (S_0, S_1, S_2, S_3, S_4 and S_5), the two hemispheres thus represented on the first map (M_0) having as their centres the vertices (N_0, S_0) corresponding respectively to the North and South poles of the globe concerned, the hemispheres represented on the next maps (M_1, M_2, M_3, M_4 and M_5) having their centres constituted respectively by the auxiliary poles consisting of the other diametrally opposite vertices (N_1, S_1; N_2, S_2; N_3, S_3; N_4, S_4 and N_5, S_5) of said icosahedron (I), the representation of each hemisphere of a map comprising:

a. a first portion obtained by the orthogonal projection of all the points of the five triangular sides ($N_0N_1N_2$, $N_0N_2N_3$, $N_0N_3N_4$, $N_0N_5N_1$) of said icosahedron (I) which converge to the pole (N_0) of the hemisphere concerned, on the plane of the pentagon ($N_1N_2N_3N_4N_5$) formed by the five base edges (N_1N_2, N_2N_3, N_3N_4, N_4N_5, N_5N_1) of said five



sides, said plane being parallel to the equator plane, and the projection of said pole (N_0) on said plane being coincident with the central point of the pentagon;

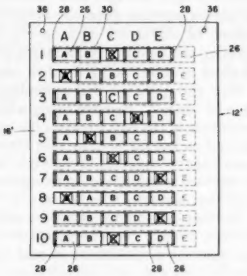
b. a second portion comprising five trapezoidal surfaces ($N_1N_2E_2E_1 \ldots N_5N_1E_{10}E_9$) each joined to one side ($N_1N_2 \ldots N_5N_1$) of said pentagon, said surfaces being obtained successively by taking them from triangles having corresponding bases ($N_1N_2, \ldots N_5N_1$) and limited by a real or auxiliary equator line ($E_1E_2, \ldots E_9E_{10}$) of a pentagon representing the central hemisphere portion of one of the other maps which is constituted around an auxiliary pole (S_4, S_5, S_1, S_2 and S_3) corresponding to the vertex of the triangle ($N_1N_2S_4 \ldots N_5N_1S_5$) of the central portion of said icosahedron (I) of which the base is the specific one of the sides ($N_1N_2, \ldots N_5N_1$) of the pentagon ($N_1N_2N_3N_4N_5$) to which the thus taken trapezoidal surface is to be joined;

c. and a third portion comprising five triangular surfaces ($N_1E_1E_{10}$, $N_2E_2E_2$, $N_3E_3E_4$, $N_4E_7E_6$, $N_5E_9E_8$) inserted successively between two adjacent trapeziums joined to the sides (N_1N_2, N_2N_3, N_3N_4, N_4N_5) of the pentagon ($N_1N_2N_3N_4N_5$), said triangular surfaces being obtained by taking the remaining triangular portions of the triangles constituting the central areas of the other five maps, after removing therefrom the trapezoidal portions necessary for constituting the representation of the second hemisphere, said triangular portions being converted topologically and filling thereafter any empty space between the trapeziums.

3,868,782
TEST SCORING DEVICE

Joseph F. Burchette, P.O. Box 56, Jenks, Okla. 74037

Filed July 5, 1973, Ser. No. 376,612
Int. Cl. G09b 1/06
U.S. Cl. 35—48 R 2 Claims

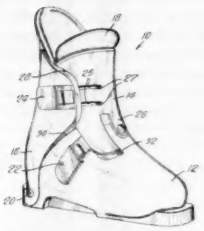


1. For use in combination with an answer sheet for a multiple choice type examination wherein the answer sheet is divided into a plurality of vertically spaced horizontal rows, each row corresponding to a question on the examination, each row having at least a portion thereof subdivided into a number of horizontally aligned spaces equal to the number of answer choices for the question corresponding to that row, whereby the examinee can place a mark in one space on a given row, whereby the examinee can place a mark in one space on a given row to indicate his answer choice to the question corresponding to that given row; an examination scoring device comprising: a flat rectangular board adapted to be disposed over said answer sheet and having a plurality of vertically spaced and horizontally extending openings, said openings haaving a vertical spacing equal to the vertical spacing of said rows on said answer sheet and extending horizontally for a distance at least as long as the subdivided portions of said rows, each opening having a lower portion of a predetermined vertical width and superimposed over the vertical dimension of the underlying row on the answer sheet, said predetermined vertical width being sufficiently great to expose a major portion of the vertical dimension of the underlying row on the answer sheet, each opening also having an upper portion whose width is greater than the lower portion, the upper portion forming flat shoulders on opposite sides of the lower portion of said opening, a plurality of nontransparent rectangular slide members having a vertical width equal to the width of the upper portion of said opening and slidably disposed in each opening and resting on said shoulders for horizontal sliding movement backand forth in each opening, a cover member disposed on said board for retaining said slide members in said openings, said cover member having a plurality of vertically spaced and horizontally extending slots narower than the vertical width of said slide members and located over said openings, each of said slide members having a tab thereon projecting outwardly through its associated slot to permit horizontal movement of each slide member in its associated opening, the number of slide members in a given opening being such in relation to the horizontal length of said opening that all of the spaces in a row beneath sid opening will be visually obscured except for a predetermined space which represents the corrct answer for that row, so that, when said board is disposed over said answer sheet, the examiner can compare the answers selected by the examinee with the correct answers and determine the score, the horizontal length of each opening of said board being equal to the length of the subdivided portion of the underlying row on said answer sheet plus the length of one slide member, and the number of slide members in each opening being equal to the number of spaces in the underlying row.

3,868,783
SKI BOOT

Domenico Caporicci, Ville St. Laurent, Quebec, Canada, assignor to Norstar Ski Corporation Ltd., Quebec, Canada

Filed Jan. 14, 1974, Ser. No. 433,148
Int. Cl. A43b
U.S. Cl. 36—2.5 AL 7 Claims

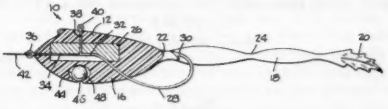


1. A ski boot comprising;
a bottom section;
a tongue section; and
a back section;
said tongue section comprising a portion which is U-shaped in cross section, at an edge of said tongue section;
said bottom section comprising a portion which is U-shaped in cross section, at an edge of said bottom section;
said U-shaped portion of said tongue section being interjoined with said U-shaped portion of said bottom section at a joint at the front part of the boot, said U-shaped portions being movable relative to one another at said joint;
whereby said boot is flexible at said joint;
wherein the legs of the U-shaped portions are interconnected by a slidable fastener.

3,868,784
FISHING LURE

Joseph J. Sabol, West Hazleton, Pa., assignor to Garcia Corporation, Teaneck, N.J.

Filed Apr. 12, 1973, Ser. No. 350,648
Int. Cl. A01k 85/00
U.S. Cl. 43—42.23 10 Claims



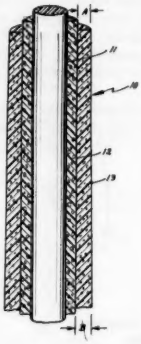
1. A fishing lure comprising in combination, a body portion having a belly portion, aa hook extending from the lower rear portion of said belly portion, said hook extending downwardly before curving upwardly in a substantially arcuate manner and terminating in a barbed point in spaced relation directly rearwardly of the body portion, a cork insert medially disposed within said body portion, said hook having a shank portion extending upwardly into said cork insert and having an extension passing forwardly through said body portion terminating in an eye disposed substantially medially of the front surface of the body portion, a second extension of said shank portion passing upwardly through the body portion and terminating in a second eye disposed substantially medially of the upper surface of said body portion.

3,868,785

FLYLINE FOR FISHING

Danny R. Foote, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa

Filed Dec. 7, 1973, Ser. No. 422,715
Int. Cl. A01k *91/00*
U.S. Cl. 43—44.98 **14 Claims**



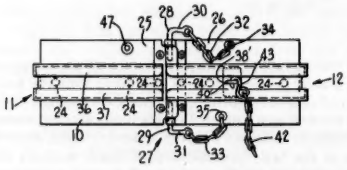
1. A flyline for fishing and comprising a core with a plurality of coatings applied thereover, said line comprising:
   a. a continuous filament core extending axially along said line;
   b. a first coating arranged coaxially over said core and comprising a plastic matrix retaining a plurality of first microballoons distributed therethrough and with said microballoons having a diameter ranging from between about 10 microns and up to about 105 microns; and
   c. a second coating arranged coaxially over said first coating and comprising a plastic matrix retaining a plurality of second microballoons distributed therethrough and with said second microballoons having an average diameter substantially less than that average diameter of said first microballoons and ranging in diameter from between about 10 microns and up to about 75 microns.

3,868,786

BELT OR COLLAR WITH RUNNER TRACK

Joan M. Lippe, 303 West Price St., Linden, N.J. 07036; Irving Goldfarb, 8101 Glenwood Rd., Brooklyn, N.Y. 11236, and Harry Jablon, 602 Birchwood Rd., Linden, N.J. 07036

Division of Ser. No. 27,486, April 13, 1970, Pat. No. 3,721,216, and a continuation-in-part of Ser. No. 832,400, June 11, 1969, abandoned. This application Jan. 2, 1973, Ser. No. 320,601
Int. Cl. A63h *1/32*
U.S. Cl. 46—51 **7 Claims**



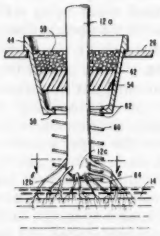
1. A belt-type toy or the like, of the character described, adapted to surround a portion of a wearer's body, comprising a generally annular belt having thereon an outwardly extending track of generally channel-shaped cross-section and outwardly extending flange members projecting beyond said track, said belt and said track thereon having at least two free end portions defining an opening through which the wearer's body portion is insertable within said belt, separate releasable connecting means independent of said belt and mounted thereon adjacent said opening and exteriorly of said track for maintaining said ends in substantially end abutting relation so that said track is uninterrupted about the wearer, and slide means retained within said track and adapted to move freely along the entire length thereof, said releasable connecting means comprising a separate generally channel-shaped member independent of said track and having flange portions adapted to overlap said oppositely extending belt flange members, said channel member being fixed to said belt adjacent one of said free end portions and extending longitudinally therebeyond, said channel member being adapted to receive said flange members of the belt adjacent the other of said free end portions, and means for holding said other free end portion within said channel member to maintain said free ends in substantially abutting relation; and an elongated flexible interconnecting member pivotally attached at one end to said slide and fixed at its other end to a toy, whereby said toy is adapted to be moved in a circular path by gyrations of the wearer's body and the associated movement of said slide member in said track.

3,868,787

APPARATUS FOR SUPPORTING HYDROPONICALLY GROWN PLANTS

Edward Wong, Jr., Los Angeles, Calif., assignor to Weingarten & Wong Enterprises, Inc., Los Angeles, Calif.

Continuation of Ser. No. 213,330, Dec. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 15,558, March 2, 1970, Pat. No. 3,660,933. This application July 2, 1973, Ser. No. 375,651
Int. Cl. A01g *31/02*
U.S. Cl. 47—1.2 **17 Claims**



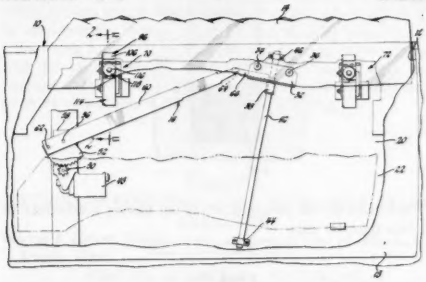
1. For use in a hydroponic system, plant-holding means including:
   a receptacle for holding an individual plant having a stem, said receptacle having an inner side wall surface, an open top and an open bottom portion through which said stem is adapted to extend; and
   means for supporting said plant laterally including yieldable means engaging said inner side wall surface and adapted to engage said stem and means for supporting said plant vertically, said vertically supporting means including a stirrup depending from said receptacle, said stirrup having an upper portion coupled to said receptacle and a lower portion forming a seat for the lower extremity of said plant stem.

3,868,788

VEHICLE WINDOW STABILIZING MECHANISM

Edward G. Podolan, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 19, 1973, Ser. No. 407,903
Int. Cl. E05f *11/38*
U.S. Cl. 49—374 3 Claims



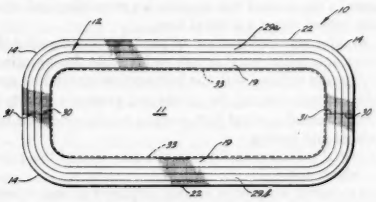
1. In a vehicle body having a window opening and a window panel movable relative to a body panel between open and closed positions with respect to the window opening, the combination comprising: stop means attached to the body panel, the stop means having upper and lower edge portions and a retrorse flange at the upper edge opening downwardly and toward the window panel, a stabilizer means attached to the lower edge of the window panel, the stabilizer means having upper and lower edge portions and a retrorse flange at the lower edge portion opening upwardly and toward the body panel, the stop means and stabilizer means being positioned on their respective panels for interlocking engagement with one another when the window panel is in the raised position, the upper edge portion of the stabilizer means being received in the retrorse flange of the stop means and the retrorse flange of the stabilizer means engaging and capturing the lower edge portion of the stop means whereby vertical movement of the window panel to raised position is stopped and the window panel is stabilized against lateral movement when in the raised position.

3,868,789

WINDOW WITH EXTRUDED SYNTHETIC FRAME AND METHOD AND APPARATUS FOR MANUFACTURE THEREOF

John I. Gates, Pasadena, Calif., assignor to Clifford C. Oliver, Newport Beach, Calif., a part interest

Continuation of Ser. No. 145,866, May 21, 1971, abandoned.
This application Feb. 5, 1973, Ser. No. 329,851
Int. Cl. E06b *3/00*
U.S. Cl. 49—501 10 Claims



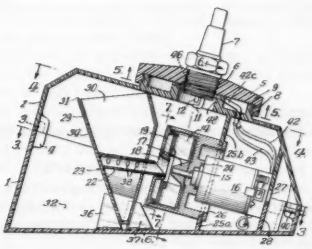
1. A window for boats, trailers and the like comprising a pane fabricated of a synthetic plastic material which is substantially arcuately curved along at least a portion of its periphery and free of abrupt corners, a first frame member extending essentially continuously circumferentially of the pane and mounting the pane therein, the first frame member being correspondingly arcuately bent to conform to the curvature of said pane peripheral portion, and a second frame member adapted to mate with and be affixed to the first frame member along the extent thereof by being arcuately bent to conform to the curvature of the first frame member, the frame members being fabricated of extrusions of rigid synthetic themoplastic material, the materials from which the pane and the first frame member are fabricated being soluble in a common solvent, the first frame member extrusion defining a web extending substantially normal to the pane and first and second spaced flanges extending from one side of the web and between which the pane is disposed and to one of which the pane is solvent welded, the first and second frame members defining means for mounting the window and including a mounting flange extending from the web of the first frame member away from the pane and a mounting flange extending from the second frame member for confronting the first frame member mounting flange when the frame members are mated, so that the mounting flanges are cooperable on mating of the frame members for engagement on opposite sides of structure defining a window opening and circumferentially of the opening for mounting the window in the opening.

3,868,790

SPARK PLUG CLEANER

Roy A. Fricke, 1034 Ashland Ave., River Forest, Ill.

Filed Aug. 17, 1973, Ser. No. 389,332
Int. Cl. B24c *3/34*
U.S. Cl. 51—9 18 Claims



1. An enclosed spark plug cleaner comprising a closed main casing which includes a main body portion, a high speed motor and connected centrifugal particle projector in said main body portion, said projector comprising an impeller and an impeller housing having an axial inlet and a peripheral outlet, a hopper which opens upwardly for receipt of a charge of particulate cleaning material, and having a delivery outlet at its lower end communicating with the inlet of the impeller, a generally horizontally disposed feeder tube having inlet openings along its sides for a delivery of particulate material from the hopper through said openings into the tube, said tube leading into the central inlet of said impeller housing, said casing comprising a removable cover portion for said main body portion, said cover comprising a holder for the threaded end of a spark plug to hold the same with its open end in alignment with said impeller housing outlet.

3,868,791

ROTARY BUFFING SLEEVE

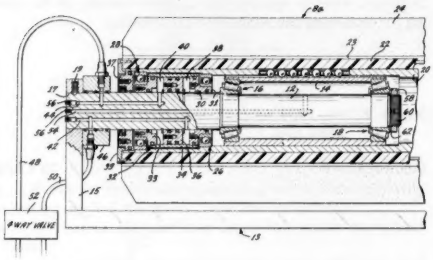
Russell W. Burns, Ventura, Calif., assignor to Merit Abrasive Products, Inc., Compton, Calif.

Filed June 4, 1973, Ser. No. 366,318
Int. Cl. B24b *5/04*
U.S. Cl. 51—34 J 6 Claims

1. A reciprocable sander comprising:
a support shaft;
a rotatable support sleeve positioned about the shaft and in spaced relation thereto;

means interconnecting the sleeve and shaft;
pistons means positioned within the sleeve in operative engagement with the rotatable support sleeve with actuation of the piston means producing a reciprocating movement of the sleeve;
means to transmit rotational movement to the sleeve;
sanding means carried by said support sleeve;
said support shaft being stationary and said support sleeve being rotated and reciprocated with respect to said stationary shaft;
a rotatable support bearing positioned on said shaft, and
said bearing having an external surface in sliding engagement with said sleeve.

2. A reciprocable sander comprising:



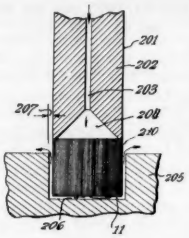
a support shaft;
a rotatable support sleeve positioned about the shaft and in spaced relation thereto;
means interconnecting the sleeve and shaft;
piston means positioned within the sleeve in operative engagement with the rotatable sleeve with actuation of the piston means producing a reciprocating movement of the sleeve;
motor means positioned within said support sleeve for imparting rotational movement to said support sleeve, and sanding means carried by said sleeve,
whereby rotational movement of the sleeve provides contact between the sanding means and a surface with the relative position of the sanding means and the surface being varied through the reciprocatory movement of the sleeve.

3,868,792
PASSAGE STRUCTURE

John A. Roberts, North Chelmsford, and Peter R. Roberts, Groton, both of Mass., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 3,931, Jan. 19, 1970, Pat. No. 3,373,367, which is a continuation-in-part of Ser. No. 471,123, July 12, 1965, abandoned. This application Feb. 16, 1973, Ser. No. 333,112
Int. Cl. B24b *35/00*
U.S. Cl. 51—204 **2 Claims**

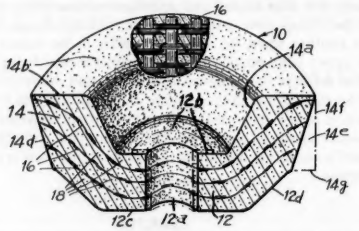
1. A hole forming tool for use with an abrasive slurry comprising:
a shank having a first end and a second end and at least one internal passage extending between said ends; and,
a tip having a first and second end, a plurality of substantially parallel internal passages therebetween, each of said passages having preselected cross section shape, said tip secured at said first end to said second end of said shank, said shank passage continuously connected to said tip passages with said second end of said tip having a preselected peripheral and cross-sectional geometric shape, at least one of the passages of the tip having a diameter of less than 10 mils.



3,868,793
INTERNALLY SAFETY REINFORCED CUP GRINDING WHEEL

John J. Corcoran, Ashland, and Paul W. Kalinowski, Boylston, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed June 18, 1973, Ser. No. 370,938
Int. Cl. B24d *7/04*
U.S. Cl. 51—209 R **8 Claims**



1. An internally safety reinforced cup type resinoid bonded abrasive grinding wheel comprising:
a recessed central hub portion of predetermined axial thickness extending radially between a relatively deep recess in one side of the grinding wheel and an opposite side of the grinding wheel to an exterior peripheral surface of the hub portion and wheel and including substantially the entire opposite side of the grinding wheel;
means in the central hub portion for mounting and rotating the wheel about a central axis;
an annular sidewall portion of predetermined radial thickness and initial axial length reduceable during grinding, integrally molded with the hub portion, extending around the central axis and the recess and generally axially from the recessed central hub portion to the one side of the wheel and having
a radial grinding surface on the one side of the grinding wheel and
an external peripheral surface adjacent to and extending from the radial grinding surface to a junction with the exterior peripheral surface of the hub portion and wheel; and
at least one internal layer of safety reinforcing material integrally molded within and bonded to the central hub and sidewall portions and having a smoothly curved shape extending continuously generally radially outward through the central hub portion, then generally both axially and radially outward in a continuously curving

path through the annular sidewall portion to an outer peripheral edge;

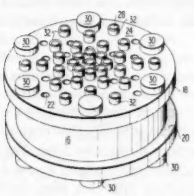
whereby the continuous internal safety reinforcing material is bonded to and continuously interconnects the central hub and sidewall portions of the wheel, has no sharp bends at which breake are likely to occur, permits the wheel to be operated safely at high speed, holds fragments of the wheel which may be accidentally broken together and thereby prevent them from being hurled at high speed and causing personal injury and the radial position of the outer peripheral edge once exposed at the radial grinding surface varies as the axial length of sidewall portion is reduced during grinding.

3,868,794

METHOD OF FINISHING LASER RODS AND FIXTURES THEREFOR

Wayne J. Zitkus, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 16, 1973, Ser. No. 379,399
Int. Cl. B24b *1/00, 7/24, 41/06*
U.S. Cl. 51—216 A **14 Claims**



1. In the method of finishing laser rods wherein an end surface of a laser rod blank is ground and polished to produce the required angular orientation and degree of flatness on said end surface, the improvement which comprises the steps of securing a laser rod blank in a rigid fixture with one end of said laser rod blank projecting outwardly from a planar surface of the fixture and having its longitudinal axis disposed at an angle with respect to said planar surface corresponding to a predetermined angular orientation of said axis relative to the finished end surface to be produced on said laser rod blank, releasably mounting a glass sleeve on the outer surface of said one end of said laser rod blank, mounting a plurality of glass feet on said planar surface at points spaced from said laser rod blank and from one another, and simultaneously finishing said one end of said laser rod blank, said glass sleeve and said glass feet in a plane parallel to said planar surface.

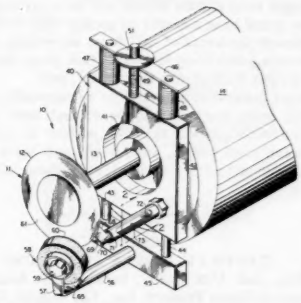
10. A rigid metal fixture for use in finishing laser rod end surfaces comprising a body, a pair of spaced apart planar surfaces on said body, a plurality of spaced parallel bores formed in and extending through said body and in which to accommodate a like plurality of laser rod blanks in slip fit relationship, sais bores each having a terminal end opening communicating with each said planar surface and having its longitudinal axis disposed at a predetermined angle with respect to each of said planar surfaces and therewith defining by such angle the angular planar surface orientation impartable to the end surfaces of said laser rods, and a plurality of glass discs projecting from each of said pair of planar surfaces at mutually spaced locations and laterally spaced from said bore openings.

3,868,795

APPARATUS FOR CONTINUOUSLY SHARPENING A ROTARY BLADE

J. Samuel Rees, Rt. 1, Box 4, Preston, Ga. 31824

Filed Sept. 25, 1972, Ser. No. 291,734
Int. Cl. B24b *3/36*
U.S. Cl. 51—248 **9 Claims**



6. Apparatus for continuously sharpening the peripheral edge of a rotary blade mounted for rotation by a drive shaft, comprising:

a support member mounted in fixed relation to the peripheral edge of the rotary blade;

first support means adjustably connected to said support member for selective positioning in radial spaced apart relation to said peripheral edge;

said first support means including resilient means urging said first support means toward said selected radially spaced position and being resiliently yieldable in a direction of increased radial spacing;

a blade sharpening member mounted on said first support means maintained in blade sharpening contact with one side of said peripheral edge; and

deburring means mounted on said support member and urged into maintained deburring contact with another side of said peripheral edge, irrespective of said radial spacing of said blade sharpening member on said first support means.

3,868,796

SIDE DOOR INTRUSION PROTECTION

George F. Bush, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 4, 1973, Ser. No. 347,960
Int. Cl. E04c *2/38*
U.S. Cl. 52—618 **2 Claims**

1. A reinforced door panel construction, comprising:

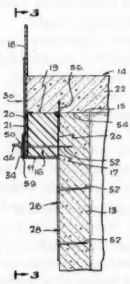
a. an annular frame having a peripheral flange lying substantially transverse to an axis of said frame and forming a mounting surface,
b. an outer door panel secured to said flange at least at circumferentially spaced locations of said flange,
c. a convoluted inner panel secured to said outer panel at least at two opposite edges thereof, said inner panel being formed from high strength cold-rolled steel having a strength level at least 90,000 ksi, the convolutions of said inner panel have a height no greater than three times the minimum thickness of said foam separating said panels, and each panel being formed of thin gauge sheet material no greater in thickness than 0.031, and
d. a rigid foam core effective to substantially occupy the entire space between said inner and outer panels and effective to provide the sole surface to surface bond between said panels, said panel and foam composite gradually deforming under load without abrupt crumbling.

3,868,797

CANTILEVER DECK STRUCTURE

Harry Fox, and Alex Hardy, both of Los Angeles, Calif., assignors to Harco Products Inc., Los Angeles, Calif.

Filed Dec. 27, 1973, Ser. No. 428,754
Int. Cl. E04b *1/34*
U.S. Cl. 52—73 **13 Claims**



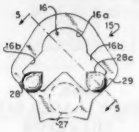
1. A cantilever deck form for a wall structure whose upper end follows an irregular curve, comprising a base portion and a wall portion, said base portion comprising a strip of polystyrene foam having a first surface adapted to lie against a generally perpendicular surface of the upper portion of the wall structure and a second generally horizontal surface constituting the base surface of the form, a plurality of brackets adapted to be connected to the wall structure, in spaced relation to each other along the said irregular curve, each bracket comprising a depending anchor portion adapted to abut and be secured to a surface of the wall structure, a support surface for said strip of polystyrene foam, and an upwardly projecting form supporting portion, said strip of polystyrene foam mounted on the support surface of the brackets and shaped so that when the strip of polystyrene foam is mounted on the support surface of the brackets, the second generally horizontal surface of the strip of polystyrene foam lies at least close to the upper end of the wall structure, said wall portion of the form comprising a thin sheetlike strip of fiber glass mounted edgewise on the support surface of the brackets and projecting upwardly above the upper end of the wall structure to at least the thickness of the cantilever deck, said strip of fiber glass supported both by the upwardly projecting form supporting portion of the brackets, and by said support surface, said thin strip of fiber glass sheet disposed generally perpendicular to the said second generally horizontal surface of the strip of polystyrene foam.

3,868,798

MODULES FOR THROUGH- AND UNDER-DRAWING FLOORING

Joseph P. Spica, 14337 Blackburn, Livonia, Mich. 48154

Continuation-in-part of Ser. No. 280,968, Aug. 16, 1973, Pat. No. 3,802,144. This application Apr. 8, 1974, Ser. No. 458,859
Int. Cl. E04c *2/10, 1/30*
U.S. Cl. 52—100 **10 Claims**



1. In a square integrally-formed molded plastic module adapted for laying interlocked with adjacent like modules in an array on a substantially flat and horizontal supporting surface, wherein a flat plate-like body has a multiplicity of apertures through the thickness of the body as through-drainage openings, integral equi-length feet projecting from the bottom for support of the plate spaced from the support surface to provide under-drainage spaces, the improvement comprising:
on a first side margin of the module a row of equally spaced short free-ended bar-like projections extending perpendicularly from a margin-adjacent a first straight portion of the body; certain of said feet being each located on said straight portion at a respective region of intersection by a said projection; along a second straight portion of the body at a second side margin, a row of equi-spaced like laterally projecting interlock lugs, having spacings equal to multiples of the spacing of said projections,
each lug downwardly offset from the plate top to extend under a like adjacent module and having a vertical aperture adapted to receive therein from above a foot on a said first side of a like adjacent module;
each lug having a pair of upwardly extending grip posts thereon inboard of said aperture thereof and adapted in shape and spacing to be resiliently displaced by and to receive and grip therebetween a top-entering respective projection of an adjacent module having a foot entering from above, and to be engaged in, the aperture of said lug.

3,868,799

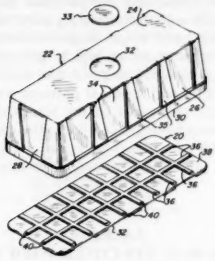
BURIAL VAULT

Walter W. Hayward, 1805 Ponderosa Pl., Loveland, Colo. 80537

Filed Apr. 18, 1974, Ser. No. 461,911
Int. Cl. E04h *13/00*
U.S. Cl. 52—131 **6 Claims**

1. In a burial vault having a generally rectangular base panel upon which is mounted a cover composed of a top panel from which resiliently flexible integral walls depend downwardly to define a peripheral skirt engageable with the perimeter of said base panel, the improvement comprising:
means distributed around the periphery of said skirt to define one part of a latching mechanism coupling said cover to said base panel;
means distributed around said perimeter to define the other part of said latching mechanism;
and sealing means extending continuously between said skirt and said perimeter to define a seal protective of the passage of fluids into the cavity defined by said cover and base panel together while permitting the egress of gases and liquids from said cavity, said sealing means including

an inwardly opening continuous recess formed in the peripheral portion of said skirt and a flexible continuous flap projecting integrally outwardly from said perimeter



a distance such that its free end is pressed only against the side wall of said recess in the latched position of said cover on said base panel.

3,868,800

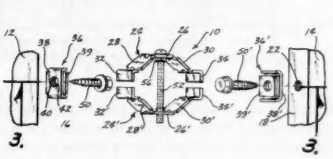
PANEL JACK CONNECTOR

David A. Peterson, Ames, Iowa, assignor to Iowa State University Research Foundation Inc., Ames, Iowa

Filed Dec. 3, 1973, Ser. No. 421,250

Int. Cl. E04b *1/48*; E04c *1/10*

U.S. Cl. 52—285 **7 Claims**



1. A connector for joining adjacent panels having spaced apart adjacent edge portions, comprising,

a first connector arm having first and second ends,

a second connector arm having first and second ends and being spaced apart from said first connector arm,

a first receiver means removably secured to the first ends of said first and second connector arms,

a second receiver means removably secured to the second ends of said first and second connector arms,

first and second screw members extending through said first and second

receiver means respectively for threadable insertion into the adjacent edge portions of the panels,

a length adjustable member connected to said first and second connector arms and extending therebetween for selectively moving the first ends of said first and second connector arms with respect to the second ends of said first and second connector arms,

said first ends of said first and second connector arms being parallel to the edge portion of the adjacent panel, said first ends being spaced apart to define an opening therebetween, said second ends of said first and second connector arms being parallel to the edge portion of the adjacent panel, said second ends being spaced apart to define an opening therebetween, said screw members extending through said openings and through said receiver means,

said first and second ends of said connector arms having inner and outer sides, each of said receiver means comprising plate means bent upon itself to form first and second plate members having substantially a U-shaped configuration, said first and second plate members being positioned on opposite sides of the ends of the connector arms.

3,868,801

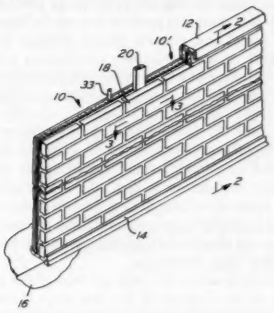
BUILDING PANEL

Gershen Weiner, 1125 N. 16th, Allentown, Pa. 18102

Continuation-in-part of Ser. No. 20,764, March 18, 1970, abandoned. This application Jan. 11, 1971, Ser. No. 105,686

Int. Cl. E04c *2/24*

U.S. Cl. 52—309 **6 Claims**



1. A prefabricated building panel adapted to be coupled with an adjacent building panel to form the wall of a building, said panel having an outer weathering or facing layer to define the outer surface of a building, said panel having an inner facing layer to define the walls of a room in a building, said outer facing layer being defined by a plurality of masonry members bonded together by a layer of polyester mortar, said mortar extending across the back of said masonry members and in the space between adjacent members, a layer of closed cell foam urethane polymer between the layer of mortar and the inner facing layer, said foam polymer bonding said inner facing layer to said layer of mortar, and a reinforcement wire mesh between said foam polymer and layer of polyester mortar.

3,868,802

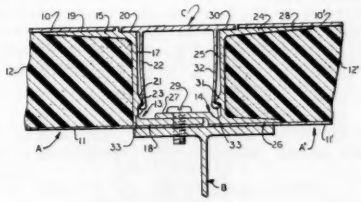
FLUSH JOINT STRUCTURE FOR ADJOINING PANELS

Theodor C. Schubach, Bonita, Calif., assignor to Rohr Industries Inc., Chula Vista, Canada and Rohr Industries, Inc., Chula Vista, Calif.

Filed Oct. 11, 1972, Ser. No. 296,517

Int. Cl. E04c *1/10*, *2/08*

U.S. Cl. 52—471 **4 Claims**



1. A concealed flush joint structure comprising in combination with two generally similar structural floor panels mounted in edge-to-edge relation on an underlying supporting member to define a common upper surface, adjacent edge faces of said first and second panels spaced slightly apart, and parallel, each of the panels having a marginal recess in an upper face thereof along its respective adjacent edge to receive the edge of a cover plate flush therein, each panel further comprising a parallel bottom facing sheet,

a first of said adjacent edge faces comprising an edge member of said first panel, of general Z cross sectional shape having an upper flange portion bonded to an underside marginal portion of a top facing sheet of said first panel and a bottom flange portion bonded to an upper side of a bottom facing sheet marginal portion of said first panel wherein said bottom flange portion projects outwardly in the direction of the adjacent floor panel,

a second of said adjacent edge faces comprising an edge member of said second panel of general channel cross sectional shape having an upper flange portion bonded to an underside marginal portion of a top facing sheet of said second panel and a lower flange portion bonded to an upper side of a substantially continuous bottom facing sheet with the open side of the channel facing laterally inwardly toward the interior of said second panel,

a flange projecting from the lower side of each second edge member and in relative overlapping engagement with the projecting flange from said one edge of the adjoining panel, the overlapping flanges holding the edge faces of the panels thereabove in spaced, parallel relation,

a core of light, structural material having high thermal and acoustical insulative properties filling the space interiorly of the facing sheets and edge members and bonded to said sheets and edge members,

a first latch step along the exterior face of the intermediate portion of the Z-shape of the first edge member,

a second latch step along the exterior face of the intermediate portion of the second edge member,

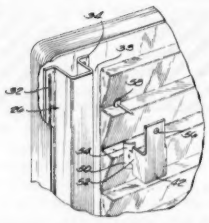
a plurality of fasteners penetrating the overlapping flange portions of the first and second edge members and the bottom facing sheet of said first panel, and directly connecting the same to said underlying supporting member, an extruded cover plate having load bearing structural integrity permanently flush fitted to and supported on said oppositely disposed upper marginal portions of the adjoining pair of panels to span the space therebetween, and

a pair of elongated latch fingers extending downwardly from the lower face of said flush plate, each latch finger being shaped and being in latching engagement with one of said latch steps when the plate is seated flush on such upper marginal panel portions.

3,868,803
PLASTIC SHUTTER AND MOUNTING CLAMP THEREFOR

Donald A. Bice, Brookfield, Wis., assignor to Benson Mfg. Corporation, Menomonee Falls, Wis.

Filed June 4, 1973, Ser. No. 366,882
Int. Cl. E06b *7/08*
U.S. Cl. 52—473 **2 Claims**

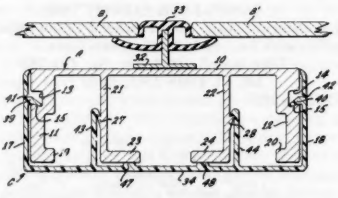


1. A plastic shutter construction comprising a panel section including marginal frame sections having a peripheral flange, elongated mounting channel members fixed to a rear surface of said marginal sections and projecting inwardly from the marginal sections toward the building structure to which the shutter is to be fastened, said channel members having a generally rectangular cross section with outturned flanges secured to the marginal sections of the shutter by sonic weldments between abutting surfaces of said flange and said marginal sections including mounting clamps adapted to engage said channel members, said mounting clamps including a web portion and two upstanding leg portions, terminal portions which diverge outwardly from said leg portions, said terminal portions including barbs which extend inwardly into the gap defined by the leg portions for rigidly grasping and securing said clamp to said channel member, and connecting portions hingedly connecting said terminal portions with said leg portions intermediate the width of the terminal portions, said connecting portions having a width less than the width of said legs and the width of said terminal portions to afford outwad displacement of said terminal portions to admit said channel members.

3,868,804
SNAP-ON MULLION COVER WITH SCORED BREAKAWAY FLANGE PORTIONS

Keith W. Tantlinger, Coronado, Calif., assignor to Rohr Industries Inc., Chula Vista, Calif.

Filed June 5, 1974, Ser. No. 476,736
Int. Cl. E04f *19/02;* **E06b** *3/00*
U.S. Cl. 52—98 **11 Claims**



1. In combination with one of a plurality of generally similar mullions mounted between adjacent windows of a transit type vehicle, each of the mullions having similar grooves extending lengthwise one along each side thereof, a mullion cover comprising:

a length breakaway channel material, comprising a bottom portion and two side flanges, fitted over the inwardly directed portion of said one mullion, each channel side flange being of a width normally to extend over and conceal the side groove in its respective side of said one mullion,

a scored breadaway line extending lengthwise along each mullion cover side flange to facilitate the removal of a selected portion of side flange material extending from the breakaway line to the free edge of such flange, each breakaway line extending along the mullion side groove therebenath and being so located as to expose a selected portion of such mullion side groove upon removal of such selected portion of side flange material, each portion of mullion side groove so exposed being of a width to receive therein a wall panel edge portion of knonw thickness.

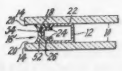
3,868,805
DOUBLE GLAZING UNIT

William R. Battersby, Lexington, Mass., assignor to USM Corporation, Boston, Mass.

Division of Ser. No. 137,274, April 26, 1971, Pat. No. 3,759,771. This application May 24, 1973, Ser. No. 363,363
Int. Cl. E06b *3/66*
U.S. Cl. 52—616 **3 Claims**

1. An improved double glazing unit comprising a spacer, panes of glass on opposite sides of said spacer, the spacer being spaced inwardly from the edges of said panes to form a channel defined by the outer face of said spacer and the surfaces of said panes in the areas from the spacer to the edges

of said panes, said spacer being of generally rectangular cross-section including opposed surfaces fitting snugly against the inner surfaces of said panes to resist passage of material, a body of solidified stiff resilient thermoplastic resinous material cast from molten state in said channel with marginal edge portions of said panes extending beyond said body of resinous material, said body having first portions adjacent said panes and strongly adherent to said panes and having an interconnecting web portion extending between and joining said first



portions, said web portion having a concave outer surface such that the web has a thin central portion for flexibility and increases in thickness to a maximum adjacent the glass, the central portion of said web portion having a thickness determined by the strength and stiffness of the resinous material used sufficient to hold said panes against separation but providing limited flexibility to accommodate relative movement of said panes caused by differences in thermal expansion due to differences in temperature of the panes.

3,868,806

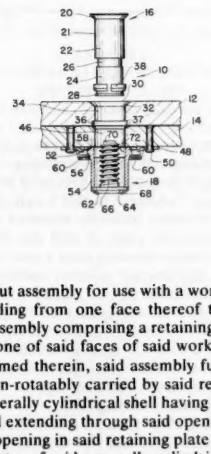
BARREL NUT ASSEMBLY

Ervin J. Dey, Santa Fe Springs, Calif., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 21, 1973, Ser. No. 362,175

Int. Cl. F16b *5/02*

U.S. Cl. 52—758 F **12 Claims**



1. A barrel nut assembly for use with a workpiece having an opening extending from one face thereof to the other face thereof, said assembly comprising a retaining plate adapted to be secured to one of said faces of said workpiece and having an opening formed therein, said assembly further comprising a barrel nut non-rotatably carried by said retaining plate and including a generally cylindrical shell having a bearing surface on one end and extending through said opening in said retaining plate, said opening in said retaining plate being larger than the outer diameter of said generally cylindrical shell adjacent said bearing surface whereby said bearing surface is adapted to bear against said one of said faces of said workpiece, the inner diameter of said bearing surface being no greater than the diameter of said opening in said workpiece at said one of said faces against which said bearing surface is adapted to bear, the other end of said generally cylindrical shell including thread means extending toward said one end of said generally cylindrical shell and terminating intermediate the ends thereof.

3,868,807

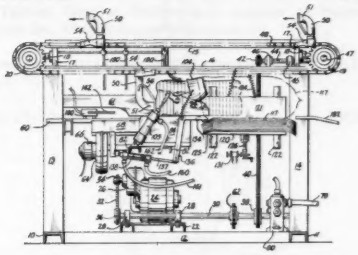
BAGGING PROCESS

Billy P. Noyes, and Howard L. Willard, both of Seattle, Wash., assignors to Alvin C. Formo, Seattle, Wash.

Continuation of Ser. No. 164,863, July 6, 1971, abandoned, which is a continuation of Ser. No. 15,763, March 2, 1970, abandoned, which is a division of Ser. No. 757,513, Aug. 5, 1968, Pat. No. 3,508,379, which is a continuation of Ser. No. 299,948, Aug. 5, 1963, abandoned. This application Apr. 23, 1973, Ser. No. 353,707

Int. Cl. B65b *5/06, 43/26, 57/12*

U.S. Cl. 53—29 **1 Claim**



1. In the process of automatically bagging successive articles including supplying a pack of bags at a bag-filling station, successively and intermittently placing articles to be bagged at a loading station ahead of the bag-filling station along the path of pusher means moving from the loading station to and past the bag-filling station, blowing air toward the mouth of the top bag in the pack for partially opening such bag mouth, and mechanically distending the partially-opened mouth of such top bag for receiving an article to be bagged by movement of such pusher means, the improvement which comprises moving pusher means continually and uninterruptedly always in the same circulatory sense along an orbital path past the loading station whether or not an article to be bagged is located at such loading station and then to and past the bag-filling station, initiating operation of an air jet automatically toward the mouth of the top bag only in response to arrival at the loading station of an article to be bagged, clamping the bags in the bag pack during such air blowing for partially opening of the mouth of the top bag and releasing the top bag as its mouth is mechanically distended, reclamping the bags in the bag pack below the top bag prior to moving the pusher means past the bag-filling station, continuing movement of the pusher means to and past the bag-filling station while the bags in the pack below the top bag are held in clamped condition, and by such movement of the pusher means past the bag-filling station removing the top bag from the stack only if the mouth of the top bag is mechanically distended and the pusher means moves an article to be bagged from the loading station into such distended mouth of the top bag, the pusher means otherwise passing over the top bag if its mouth is not distended.

3,868,808

APPLICATON OF CONTAINER CLOSURES

Henry Richard Preston, 18 Corella Ave., Melton, Victoria, Australia

Filed Nov. 12, 1973, Ser. No. 414,730

Claims priority, application Australia, Nov. 22, 1972, 1327/72

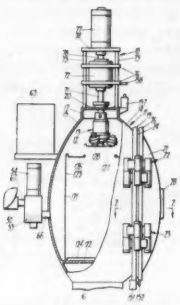
Int. Cl. B65b *31/02, 7/28*

U.S. Cl. 53—97 **10 Claims**

1. Apparatus for applying a lid to the opening of an open-topped container under vacuum conditions, the container opening having an upwardly rounded rim and the lid having an upstanding, outwardly hooked peripheral flange to fit over and around the container rim, which apparatus comprises a hollow vessel defining a vacuum chamber and including door means to provide access to the chamber whereby the open

topped container can be placed in the chamber; means to evacuate the chamber when the door means is closed; and lid applicator means to hold the lid within the chamber and operable to apply the lid to the opening of the container while the chamber is evacuated; said applicator means comprising

a. a rotary rolling head disposed in an upper-part of the chamber and including a working roller support structure rotatable about a vertical axis of rotation, working roller carriers pivotally mounted on the support structure for pivoting movement about respective horizontal pivot



axes, and working rollers rotatable on said carriers about upright roller axes disposed outwardly of said horizontal pivot axes;

b. lid holding means carried by the rolling head and effective to hold the lid beneath the rolling head;

c. means to cause relative vertical movement between the container and the rolling head whereby to apply the lid to the container opening; and

d. means to rotate the working roller support structure to cause the working rollers to run on the peripheral flange of the lid.

3,868,809

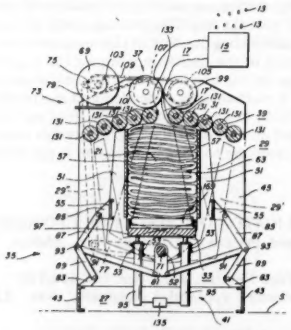
FIBER BALING APPARATUS

Woodrow W. Bledsoe, 1112 Deramus St., Prattville, Ala. 36067

Filed Apr. 15, 1974, Ser. No. 461,153

Int. Cl. B65b *63/04, 63/02*

U.S. Cl. 53—117 **12 Claims**



1. Fiber baling apparatus for compressing a bat of fibers into a tightly compressed bale, said fiber baling apparatus comprising frame means restingly supported upon a support surface, cradlelike receptacle means having an upwardly directed opening for receiving the fiber bat, platen means establishing a bottom of said receptacle means for supporting the fibers contained therein, rocking means coupled to said cradlelike receptacle means for causing said cradlelike receptacle means and said platen means to rock to and fro as the bat of fibers is being received in said receptacle means, means disposed above said upwardly directed opening of said receptacle means for delivering a thin bat of compressed fiber into said receptacle means, retaining means disposed above said receptacle means and coacting with said platen means for further compressing the bat while it is being received in said receptacle means as said receptacle means rocks, and receding pressure means attached to said platen means for yieldably supporting the weight of the compressed fiber and for maintaining compression on the fibers as said receptacle means is being filled with the fibers.

3,868,810

MACHINE FOR BINDING TOGETHER A NUMBER OF BARS, TUBES OR SIMILAR ELONGATED OBJECTS

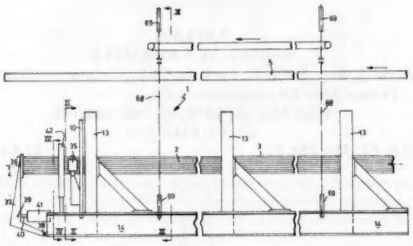
Fredericus Antonius Jozef Bos, Enkhuizen, Netherlands, assignor to Polva-Nederland B.V., Enkhuizen, Netherlands

Filed July 31, 1973, Ser. No. 384,367

Claims priority, application Netherlands, Feb. 3, 1972, 7201437

Int. Cl. B65b *13/04, 27/10*

U.S. Cl. 53—198 R **9 Claims**



1. An apparatus for binding together a plurality of bars, tubes or similar elongated objects including;

a frame having a longitudinal axis, and including at least three supports transverse to said longitudinal axis;

a disc-shaped member rotatably mounted on each of said transverse supports, each of said disc-shaped members including a recess extending from a portion of the periphery of said disc-shaped member radially inwardly and having an inner portion, said inner portion of said radial inward extension of said recess extending beyond the axis of rotation of said disc-shaped member;

a substantially U-shaped support mounted on each of said disc-shaped members to coincide with said inner portion of said recess, said U-shaped support having first and second substantially vertical arms;

first and second claw members each being pivotally attached respectively to said first and second vertical arms; claw member pivoting means, mounted on said disc-shaped member, for pivoting said first and second claw members inwardly fo form with said U-shaped support an enclosure completely around the objects, said enclosure having an axis of rotation substantially coinciding with the axis of rotation of said rotating disc member;

rotating means for rotating said rotating disc member; and

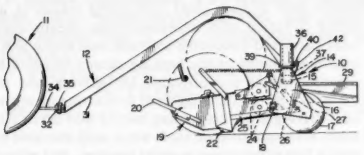
tape supply means for supplying and guiding tape to the objects rotating with said rotating discs from a direction transverse to said longitudinal axis.

3,868,811

METHOD AND APPARATUS FOR HARVESTING CROPS USING A TRACTOR-PULLED CROP HARVESTER

George B. Cicci, Broadview, Ill., and Guy O. Tufts, Phoenix, Ariz., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 20, 1973, Ser. No. 353,037
Int. Cl. A01d
U.S. Cl. 56—1 7 Claims



1. A crop harvester adapted to be pulled by a tractor having wheels on either side thereof comprising:

a frame;

a pair of ground wheels supporting said frame;

harvesting apparatus forwardly mounted on said frame and adapted to receive and harvest crops;

an arched hitching tongue having one end pivotally mounted to said frame about an axis located proximate to the transverse center of said frame, a distal end adapted for pivotal connection to a tractor hitch, and an intermediate portion capable of passing over said harvesting apparatus, said harvesting apparatus remaining in a forward orientation, said tongue being of sufficient length to permit said harvester to be operated with said harvesting apparatus outboard of said tractor wheels on either side thereof and substantially perpendicular to the path of travel; and

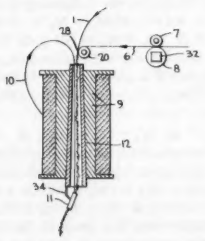
control means connecting said frame to said tongue to determine the relative angular position thereof to selectively permit placement of said harvester on either side of said tractor.

3,868,812

PROCESS AND APPARATUS FOR THE MANUFACTURE OF EFFECT YARN

Remy Chatin, Chavanoz, France, assignor to Moulinage Et Ritorderie De Chavanoz, Chavanoz, France

Continuation-in-part of Ser. No. 99,536, Dec. 18, 1970, abandoned. This application Nov. 23, 1971, Ser. No. 201,286
Int. Cl. D01h *7/88*; D02g *3/34*, *3/38*
U.S. Cl. 57—12 11 Claims



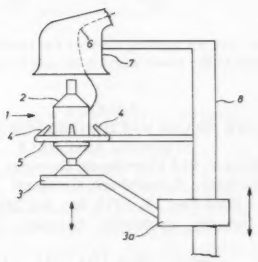
1. An apparatus for manufacturing fancy yarn including: means for supplying a core yarn to at least one overfeed point; at least one means for supplying an effect yarn to said overfeed point, the effect yarn being overfed in relation to the core yarn; false twist means spaced from said overfeed point to define a path of travel for the core and effect yarns from said overfeed point to said false twist means; the core and effect yarns being assembled into an intermediate yarn by said false twist means along said path of travel; means for supplying a binding yarn; means to bind the intermediate yarn with the binding yarn upon the reversal of the false twist forming a fancy yarn; and means for receiving the fancy yarn, the improvement which comprises means located along said path of travel for guiding the binding yarn substantially parallel to the intermediate yarn.

3,868,813

DEVICE FOR WINDING-OFF YARN ENDS

Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano SA, Vernier-Geneva, Switzerland

Filed Feb. 4, 1974, Ser. No. 439,124
Claims priority, application Switzerland, Feb. 2, 1973, 1547/73
Int. Cl. D01h *13/00*, *15/00*
U.S. Cl. 57—34 R 7 Claims



1. A device for detaching and winding off the exposed yarn end from a body of wound-up yarn on a bobbin by means of compressed air, comprising a holder for a bobbin; a duct system for compressed air comprising an inlet duct, at least three outlet nozzles arranged concentrically around and directed towards the axis of said bobbin when mounted on said holder, and intermediate duct means connecting said inlet duct ot said nozzles; a driving device for effecting relative to-and-fro movement in the direction of the of said bobbin, between of said holder and said duct-system, said nozzles being directed to detach and wind off the exposed yarn end from said bobbin; and a reception tube mounted to receive said yarn end when detached from said bobbin, said reception tube having an open end directed towards said nozzles.

3,868,814

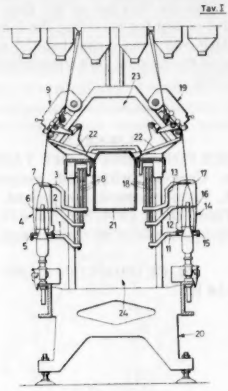
SPINNING FRAME HAVING TWO CONFRONTINGLY MOUNTED RING ROWS

Natale Chiari, Colgone Bresciano, Italy, assignor to Edera S.p.A. Officina Meccanica Tessile, Milan, Italy

Filed Sept. 24, 1973, Ser. No. 399,711
Claims priority, application Italy, Sept. 29, 1972, 29905/72
Int. Cl. D01h *5/68*, *11/00*
U.S. Cl. 57—34.5 4 Claims

1. A single-control spinning frame having two confrontingly mounted spindle rows, in which each spindle row comprises three bars movable and respectively adapted to support the slider-carrying rings, the anti-ballooning containers and the thread guides, said three movable bars relative to one of the spindle rows being independent of those relative to the other spindle row, the inner space between the two machine fronts remaining thereby free of connecting cross-ties, an air-drawing manifold for grasping broken threads in the central

portion of said inner free space, air moving devices for cleaning the machine cylinder set in the upper portion of said inner



free space, and air moving devices for cleaning the two machine fronts in the lower portion of said inner free space.

3,868,815

DRIVE AND BRAKE MECHANISM FOR AN OPEN-END SPINNING ASSEMBLY

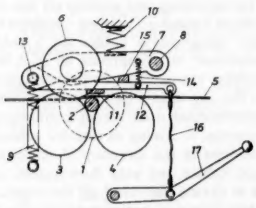
Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Wilhelm Stahlecker, Reichenbach, Germany

Filed Aug. 18, 1972, Ser. No. 281,759

Claims priority, application Germany, Aug. 18, 1971, 2141276

Int. Cl. D01h *1/24, 7/22, 1/12*

U.S. Cl. 57—88 **55 Claims**



1. An arrangement for driving and braking a rotatable turbine shaft of an open-end spinning assembly comprising:

support means for supporting the turbine shaft in position, said support means including radial support means at one side of said turbine shaft for limiting radial movement of said turbine shaft toward said one side,

selectively engageable driving means for imparting rotational movement to said turbine shaft, said driving means including driving shaft contacting means which force said turbine shaft against said radial support means to aid in radially supporting said turbine shaft during driving thereof,

selectively engageable braking means for imparting braking forces to said turbine shaft, said braking means including braking shaft contacting means which force said turbine shaft against said radial support means to aid in radially supporting said turbine shaft during braking thereof,

and interconnecting means for transferring reaction forces experienced by said braking shaft contacting means during engagement of said braking means as disengaging forces which disengage said driving shaft contacting means with increased braking forces against said turbine shaft being accompanied by an automatic decrease in driving forces against said turbine shaft and with one of said driving shaft contacting means and said braking shaft contacting means forcing said turbine shaft against said radial support means at all times during engagement and disengagement of said driving and braking means, whereby a firm radial support of said turbine shaft is assured during transition between driving and braking theroef,

wherein said braking shaft contacting means is a brake lining, wherein said interconnecting means includes a brake arm and a movable element, said brake arm having said brake lining of the braking means attached thereto, wherein means are provided for moving said movable element with said driving shaft contacting means to force said driving shaft contacting means into driving engagement with said turbine shaft when said movable element is in a first driving engagement position, and wherein said brake arm and movable element are movably connected to one another for transmitting reaction forces acting on said brake lining to move said movable element from said driving engagement position.

3,868,816

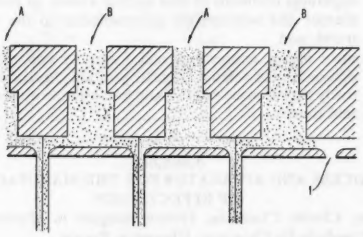
COMPOSITE ACRYLIC FIBERS AND SPUN YARNS

Yasuo Saji, and Shigeru Ikegami, both of Sunto, Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Division of Ser. No. 848,796, Aug. 11, 1969, abandoned. This application Dec. 29, 1971, Ser. No. 213,726

Int. Cl. D02g *3/24, 3/02;* **D01d** *5/28*

U.S. Cl. 57—140 BY **14 Claims**



1. Composite acrylonitrile fibers comprising acrylonitrile copolymers *A* and *B*, said copolymers A and B comprising acrylonitrile and comonomers copolymerizable therewith; wherein the amount of said comonomers in said acrylonitrile copolymer A is shown by the following relationships:

$$2(M_a - N_a - 4.5)^2 + 9(M_a + N_a - 10.5)^2 \leqq 36 \text{ and}$$

$$19 \leqq M_a + N_a + 10L_a \leqq 32.5;$$

wherein the amount of said comonomers in said acrylonitrile copolymer B is shown by the following relationships:

$$0.16\,(\sqrt{24}\,M_b - N_b - 8\sqrt{24})^2 + (M_b + \sqrt{24}\,N_b - 8)^2 \leqq 25 \text{ and}$$

$$17 \leqq M_b + N_b + 10L_b \leqq 30;$$

wherein the compositions of said acrylonitrile copolymers A and B are related to satisfy the following relationships;

$$(M_a + N_a) - (M_b + N_b) > 1 \text{ and}$$

$$-0.35 \leqq L_a - L_b \leqq 0.35;$$

wherein *M* represents the amount, in weight percent, of hydrophobic comonomer in said copolymers A and B, said hydrophobic comonomer having a solubility in water at 20° C of less than 10 g./100 ml.; wherein *N* represents the amount, in weight percent, of hydrophilic comonomer, which does not contain an ionizable group, in said copolymers A and B, said hydrophilic comonomer having a solubility in water at 20° C of at least 50 g./100 ml.; wherein *L* represents the amount, in weight percent, in said copolymers A and B of an ionizable comonomer

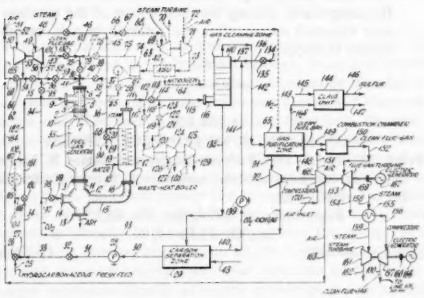
selected from the group consisting of sodium allylsulfonate and sodium methallylsulfonate; and wherein a and b designate comonomers corresponding to copolymers A and B, respectively.

3,868,817

GAS TURBINE PROCESS UTILIZING PURIFIED FUEL GAS

Charles P. Marion, Mamaroneck, N.Y.; Warren G. Schlinger, Pasadena, Calif.; Albert Brent, Dix Hills, and James R. Muenger, Beacon, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 27, 1973, Ser. No. 428,981
Int. Cl. F02b *43/12*
U.S. Cl. 60—39.02 **24 Claims**



1. A process for the generation of power by means of a gas turbine having a combustion chamber and an expansion turbine comprising:

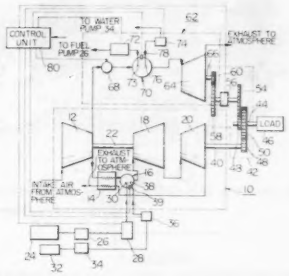
1. reacting a hydrocarbonaceous fuel with a free-oxygen containing gas by partial oxidation in the presence of a temperature moderator selected from the group consisting of at least a portion of the CO_2-rich gas stream from step (3), at least a portion of the exhaust flue gas from step (4), and mixtures thereof in the reaction zone of a non-catalytic free-flow gas generator at an autogenous temperature in the range of about 1500°F to 3500°F and a pressure in the range of about 10 to 180 atmospheres absolute to produce an effluent gas stream comprising mixtures of H_2, CO, CO_2 and H_2O and one or more of the members of the group N_2, CH_4, COS, H_2S and Ar, and particulate carbon; and wherein the mole ratio (CO/H_2) dry basis of the effluent gas from the generator is at least 0.30;
2. cooling the effluent gas from (1) by indirect heat exchange with water thereby producing steam;
3. introducing the cooled effluent gas from (2) into a gas cleaning and purification zone and separately obtaining therefrom a stream of clean fuel gas comprising mixtures of H_2 and CO and one or more members of the group CH_4, N_2, H_2O, and CO_2; a CO_2-rich gas stream; a slurry stream comprising particulate carbon in a liquid vehicle; and optionally a gas stream comprising H_2S and COS; and
4. burning the stream of clean fuel gas from (3) with air in the combustion chamber of said gas turbine and passing the resulting flue gas as the working fluid through said expansion turbine to develop power and to produce exhaust flue gas.

3,868,818

AUTOMOTIVE GAS TURBINE ENGINE

Takane Itoh, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 28, 1973, Ser. No. 336,760
Claims priority, application Japan, Mar. 3, 1972, 47-22039
Int. Cl. F02c *7/02, 1/06*
U.S. Cl. 60—39.15 **1 Claim**



1. A gas turbine engine for a motor driven vehicle comprising in combination, a first stage gas turbine including an air compressor, a combustor communicating with said air compressor and a source of fuel and generating working gases when said motor driven vehicle is running under light and heavy loads, a gas generator turbine communicating with said combustor and driven by said working gases delivered therefrom, a shaft connecting said gas generator turbine to said air compressor, a power turbine coaxial with said gas generator turbine, means providing communication between said power turbine and said gas generator turbine and said power turbine being driven by said working gases delivered therethrough, a regenerator disposed between said air compressor and said power turbine, means providing communication between said regenerator with an outlet side of said power turbine of said first stage gas turbine to receive working gases therefrom for preheating air for deliverly to said combustor of said first stage gas turbine, a second stage gas turbine including a combustor communicating with said air compressor of said first stage gas turbine and said source of fuel, said last-mentioned combustor generating working gases when said motor driven vehicle is running under heavy load, and a power turbine rotatable about an axis parallel to that of said first stage turbine, the last-mentioned power turbine communicating with the last-mentioned combustor and driven by said last-mentioned working gases delivered therefrom, a flow control valve disposed between said air compressor of said first stage gas turbine and said last-mentioned combustor of said second stage gas turbine and providing communication therebetween when said motor driven vehicle is running under heavy load, a source of water, means for injecting water into said combustors of said first and second stage gas turbine when said motor driven vehicle is running under light and heavy loads, said water injecting means including respective water metering valves disposed between said source of water and said combustors of said first and second stage gas turbines for controlling the amount of water flow passing therethrough, first and second gear means connected to said power turbines of said first and second stage gas turbines, respectively, an output shaft connected to said first and second gear means, and a clutch mechanism disposed between said second gear means and said power turbine of said second stage gas turbine and providing a clutching and declutching drive connection between said output shaft and said power turbine of said second stage gas turbine.

3,868,819
EXHAUST GAS PURIFYING APPARATUS

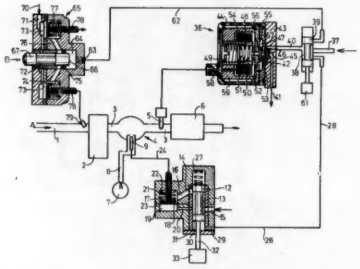
Heinrich Knapp, Leonberg-Silberberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 24, 1972, Ser. No. 308,985

Claims priority, application Germany, Nov. 24, 1971, 2158119

Int. Cl. F02b *75/10*

U.S. Cl. 60—276 **4 Claims**



1. In an exhaust gas purifying apparatus for an externally ignited internal combustion engine operating on fuel continuously injected into its suction tube as primary fuel quantities, said engine having an exhaust conduit, said apparatus being of the known type that has (a) a catalyst situated in said exhaust conduit, (b) a thermal reactor situated in said exhaust conduit upstream of said catalyst and (c) a secondary air pump connected with said thermal reactor for supplying thhe latter with secondary air, the improvements comprising

A. An oxygen sonde disposed in said exhaust conduit and emitting signals as a function of the oxygen concentration of the exhaust gases,

B. means for supplying said thermal reactor with secondary fuel quantities,

C. means coupled to said oxygen sonde for varying said secondary fuel quantities in response to said signals during the warm-up run of said engine when the temperature of said catalyst is above its reaction temperature and

D. means for varying said primary fuel quantities in response to said signals during normal operational temperatures of said engine.

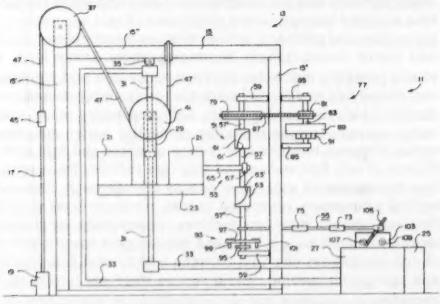
3,868,820
PUMP CONTROL MEANS

Joseph M. Lawson, P.O. Box 518, Natchez, Miss. 39120

Filed Feb. 25, 1974, Ser. No. 445,152

Int. Cl. F16h *39/46*; F15b *15/18*

U.S. Cl. 60—382 **6 Claims**



1. A control means for use with a typical counterbalanced pump unit including in general a frame, a pump rod, counterweights for offsetting the weight of the pump rod, means for driving the counterweights between upper and lower positions, and means causing the pump rod to move relative to the counterweights, said control means comprising:

a. cammed means for mounting to the frame;

b. cam means for fixedly mounting on the counterweights and for coacting with said cammed means as the counterweights are driven between the upper and lower positions to cause said cammed means to rotate;

c. linkage means for connecting said cammed means to the means for driving the counterweights to regulate the means for driving the counterweights to cause the counterweights to move between the upper and lower positions in a smooth, even rate as said cam means causes said cammed means to rotate;

d. means for temporarily storing the momentum of the rotation of said cammed means to cause rotation of said cammed means to continue after the counterweights have reached the upper or lower position;

e. stop means for stopping the rotation of said cammed means after a fixed amount of rotation; and

f. means for dissipating excessive momentum of said means for temporarily storing the momentum of the rotation of said cammed means after the rotation of said cammed means is stopped.

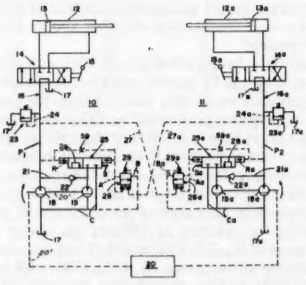
3,868,821
AUTOMATIC PUMP CONTROL SYSTEM

Frank W. Ratliff, Oak Forrest Estate, and James R. McBurnett, Corinth, both of Miss., assignors to Tyrone Hydraulics, Inc., Corinth, Miss.

Filed Mar. 20, 1974, Ser. No. 452,713

Int. Cl. F15b *18/00*

U.S. Cl. 60—421 **17 Claims**



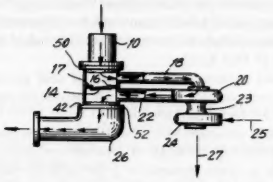
1. In an hydraulic control system of the kind including a pair of hydraulic circuits each having a pair of fluid supply pumps to be driven by a prime mover common to both circuits, each having an actuator to be driven in either of two senses in accordance with the flow of fluid in the circuit, and each circuit further including means for controlling the flow of fluid to the actuator of that circuit, the improvements which comprise: means in each circuit movable to unload one pump of that circuit; and means for effecting such movement of the movable means in response to fluid pressure in the other circuit increasing above a predetermined value.

3,868,822

INTERNAL COMBUSTION ENGINE WITH PRESSURE RESPONSIVE SUPERCHARGER BYPASS

Robert A. Keller, Smithtown, N.Y., assignor to The Echlin Manufacturing Company, Branford, Conn.

Filed May 17, 1973, Ser. No. 361,203
Int. Cl. F02b *33/44*
U.S. Cl. 60—600 **12 Claims**



1. In combination with an internal combustion engine, the engine comprising a combustion chamber, induction means for forming a fluid fuel/air mixture, an induction conduit in fluid flow connection with the induction means and the combustion chamber, and means to exhaust fluid from the combustion chamber: 1) a first bypass conduit in fluid flow connection to a first upstream portion of the induction conduit; 2) a supercharging means having an inlet and an outlet, the inlet being in fluid flow connection to the first bypass conduit; 3) drive means for the supercharging means, designed and adapted to directly and continuously utilize the energy provided by the internal combustion engine to power the supercharging means whereby the outlet pressure of the supercharger increases directly as engine power output increases; 4) a second bypass conduit in fluid flow connection with a downstream portion of the induction conduit and with the outlet from the supercharging means, whereby the supercharging means is in parallel fluid flow connection with an intermediate portion of the induction conduit between the first bypass conduit and the second bypass conduit; and 5) valve means in the intermediate portion of the induction conduit, the valve means comprising a valve seat rigidly connected to the interior of the induction conduit and a valve member moveably connected to the interior of the induction conduit and having a first pressure surface exposed to the inlet pressure of the supercharging means upstream of the valve means and a second pressure surface exposed to the pressure of the outlet from the supercharging means downstream of the valve means whereby at low outlet pressures the valve member is located out of contact with the valve seat and at high outlet pressures the valve member is urged toward and placed in contact with the valve seat so as to prevent direct flow through the induction conduit and to cause the passage of all fluid flow around the valve and through the supercharging means via the bypass conduits.

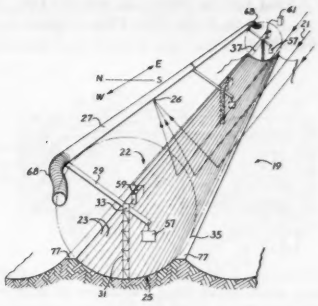
3,868,823

CONCENTRATOR, METHOD, AND SYSTEM FOR UTILIZING RADIANT ENERGY

John L. Russell, Jr., La Jolla, and Eugene P. DePlomb, San Diego, both of Calif., assignors to Gulf Oil Corporation, San Diego, Calif.

Filed Apr. 6, 1972, Ser. No. 241,522
Int. Cl. F03g *7/00*
U.S. Cl. 60—641 **60 Claims**

1. A method of concentrating the heating effect of rays emitted from a source of energy moving in a path, comprising the steps of providing a plurality of linear primary reflective surfaces, reflecting the rays, converging the reflected rays on a linear focus which moves in a predetermined path in response to the movement of the energy source, providing a linear target to receive the converged rays, and moving the



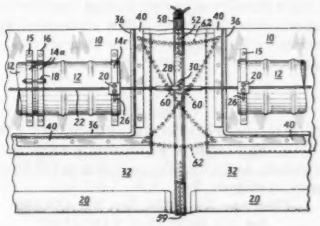
target in coincidence with said focus as it moves in its predetermined path.

3,868,824

MODULAR OIL CONTAINMENT BOOM

Robert K. Thurman, Carmel, N.Y., assignor to Merritt Division of Murphy Pacific Marine Salvage, New York, N.Y.

Continuation-in-part of Ser. No. 78,801, Oct. 7, 1970, Pat. No. 3,751,925. This application July 2, 1973, Ser. No. 375,767
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **4 Claims**



1. A module for an oil containment boom formed of a plurality of such modules connected end-to-end, comprising:

a vertical barrier member;

at least one flotation unit secured to each side of said barrier member;

a U-shaped panel of flexible waterproof material secured to said barrier member;

means for securing said panel to said barrier including a welt formed on the inner edges of the panel and a batten secured to the barrier outside and adjacent the welt and clamping the panel to the barrier;

a piping formed on said panel adjacent and parallel to each outside end edge thereof for cooperation with a similar piping on an adjacent module panel and a slotted tube to form a seal between adjacent module panels;

linking means secured to the outboard extremity of said flotation units on each side of said barrier member for linking a plurality of said modules for towing and mooring as a boom without stressing said panel;

means on each end of each linking means for releasable attachment to an adjacent end of a stress wire on an adjacent module; and

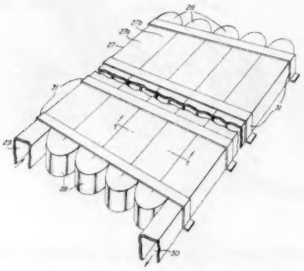
auxiliary linking means connected to the top and bottom end corners of said barrier member for linking to the top and bottom end corners of the adjacent end of an adjacent module barrier member when said modules are assembled as an oil containment boom.

3,868,825

APPARATUS FOR WORKING FROZEN GROUND

Jack R. Boyce, 442 S. 7th West, Tremonton, Utah 84337

Filed Jan. 26, 1973, Ser. No. 327,169
Int. Cl. E02d *3/00;* **F24c** *15/30*
U.S. Cl. 61—36 A **1 Claim**



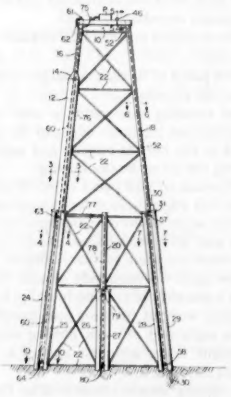
1. Apparatus for thawing frozen ground, comprising an elongate, open-bottomed duct for placement on frozen ground with its open bottom facing said ground; means for substantially sealing the longitudinal margins of said duct to substantially prevent the escape of heated air flowing through said duct; and means in flow communication with said duct for blowing heated air through and along the length of the duct unidirectionally in traveling contact with said ground, said duct being made up of a plurality of substantially parallel, elongate, duct sections lying substantially contiguously side-by-side, and a plurality of end sections at opposite ends of said duct sections interconnecting a flow channel of one of said duct sections with a contiguous flow channel of a next adjacent duct section.

3,868,826

CLUSTERED AND PROTECTED PRESSURE LINES FOR SETTING SLEEVE PACKERS

Don B. Landers, Arlington, Tex., assignor to Oil States Rubber Company, Arlington, Tex.

Filed Apr. 10, 1974, Ser. No. 459,586
Int. Cl. E02d *5/14;* **F16j** *15/02*
U.S. Cl. 61—46.5 **6 Claims**



1. In an off-shore marine structure of the type having a platform supported by one or more legs extending beneath the surface of the water and resting on the bottom of the sea and said legs having piling guide sleeves shaped to receive piles driven therethrough into the bottom, and said platform having fluid pressure supply means for selectively inflating the individual packer means in the sleeves to seal the annulus between each sleeve and its pile, improved means for coupling said pressure supply means with each of said packer means, comprising:

a. rigid main protector pipes extending down each platform leg to branching points at levels where packer means are located beneath the surface in the sleeves;

b. rigid branch protector pipes branching out at said branching point levels from each main protector pipe and extending therefrom to the inflatable packer means in the sleeves at that level;

c. manifold means in the vicinity of said pressure supply means and coupled to each main protector pipe at a level above the water surface; and

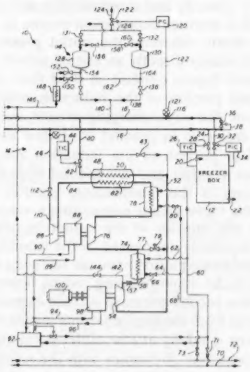
d. a flexible pressure line attached to each packer means and extending through a branch protector pipe and through a main protector pipe and to said manifold means, and each flexible line including means for coupling said pressure supply means to it.

3,868,827

AIR CYCLE FOOD FREEZING SYSTEM AND METHOD

Hans D. Linhardt, Costa Mesa; Thomas A. Carter, Whittier, and James A. Kirk, Costa Mesa, all of Calif., assignors to Airco, Inc., Montvale, N.J.

Filed Apr. 5, 1973, Ser. No. 348,410
Int. Cl. F25d *25/13*
U.S. Cl. 62—63 **10 Claims**



1. A food freezing system utilizing air as the working refrigeration fluid, comprising in combination:

a freezing chamber, having entrance and exit ports and means for passing a food product through said freezing chamber;

a refrigerant supply main connected to said freezer chamber for supplying refrigerant air to effect freezing operations; a return main for receiving warmed air from said chamber;

first stage compressor means connected for receiving the output from said return main and compressing said air to a predetermined pressure;

intercooling means connected in the air stream flow line proceeding from said first stage compressor means, for cooling said compressed air;

second stage compressor means connected to receive the output from said intercooling means, and adapted to further compress said air;

aftercooling means positioned to receive the further compressed air output from said second stage compressor means, and cool said further compressed air;

regenerative heat exchanger means connected to receive the compressed air from said aftercooler means and further cool said air by heat exchange with at least a portion of the warmed air in said return main from said freezer chamber; and

expansion turbine means for receiving the further cooled air from said regenerative heat exchanger and cooling said air to cryogenic temperatures by extracting heat energy therefrom, said turbine means being connected to supply said expanded cooled air to said supply main.

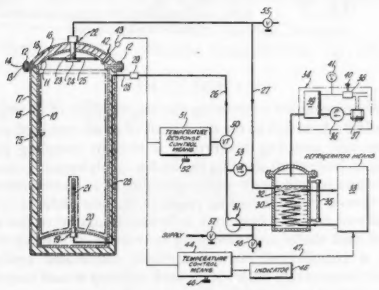
3,868,828
METHOD AND MEANS FOR PRESERVING COMESTIBLES

Ralph E. Schwartz, Elgin, Ariz., assignor to Ovitron Research Corporation, Elgin, Ariz.

Division of Ser. No. 87,060, Nov. 5, 1970, Pat. No. 3,729,948. This application Mar. 2, 1973, Ser. No. 337,664

Int. Cl. F25b *41/06*

U.S. Cl. 62—196 **10 Claims**



1. An apparatus for storing comestibles at reduced temperature and elevated pressure whereby the metabolic rate of said comestibles is lowered comprising a nondilatable comestible storage vessel, a heat exchange vessel, circulating means for causing a cooling liquid to circulate through said storage vessel and said heat exchange vessel without changing state, throttling valve means included in said circulating means connected to said storage vessel, thermostatic control means including a temperature sensitive probe for controlling said throttling valve, refrigeration means for causing a refrigerant to circulate through the heat exchange vessel, and pressurization means for supplying a pressurized gas to the heat exchange vessel whereby pressure is applied to the cooling liquid and transmitted to the storage vessel.

3,868,829
INSULATION DIVIDER FOR REFRIGERATOR CABINET

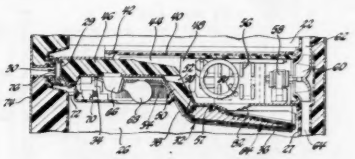
Leonard J. Mann, Kettering, and John A. Kemper, Bellbrook, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1973, Ser. No. 420,528

Int. Cl. F25d *21/14*

U.S. Cl. 62—285 **3 Claims**

1. A refrigerator including a cabinet having insulated walls enclosing a compartment, a laterally extending dividing means within said compartment dividing said compartment into an upper freezer compartment and a lower fresh food compartment, door means for closing said compartments, said dividing means including a bottom supporting wall, a drain pan spaced above said supporting wall for supporting an evaporator thereon, wherein the improvement comprises an insulation separator on said supporting wall, said separator comprising an outer molded moisture impervious plastic shell having upper, bottom, front, rear and side walls forming an air-tight sealed chamber, said shell upper and bottom walls substantially conforming to and contiguous with said drain pan and said supporting wall, respectively; said sealed chamber com-



pletely filled with unfused, pre-expanded polystyrene contacting beads; each of said beads being substantially spherical in shape and having a diameter of about 0.060 to 0.100 inches, said beads forming a plurality of air spaces therebetween so that static air is confined in the air spaces whereby convection heat transfer between the upper and lower walls of said separator shell is obviated.

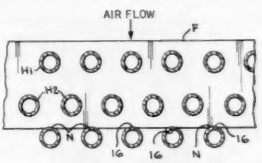
3,868,830
CONDENSATE REMOVAL DEVICE FOR HEAT EXCHANGER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Raymond B. Trusch, South Windsor, and Edward W. O'Connor, Simsbury, both of Conn.

Filed Aug. 31, 1973, Ser. No. 393,526

Int. Cl. F23b *9/08*

U.S. Cl. 62—290 **18 Claims**



1. In a slurper in a heat exchanger of the type including a set of coolant tubes and an array of parallel plates or fins, said coolant tubes passing through said fins and being disposed for circulation therein of a liquid cooling medium while a gas flow is maintained between said coolant tubes and through said array of fins, vapors carried by said gas flow being precipitated onto said coolant tubes and fins in the process, the improvement comprising a set of slurper tubes disposed in contact with the gas outlet portions of said fins, each of said slurper tubes containing a plurality of small openings and being adapted for common connection to means for sucking fluids through said openings and passing them through said slurper tubes to an external discharge.

3,868,831
COUPLINGS

Ernest Rex Stock, McKinnon, Victoria, Australia, assignor to E. R. Stock Proprietary Limited, Cheltenham, Victoria, Australia

Filed May 24, 1973, Ser. No. 363,420

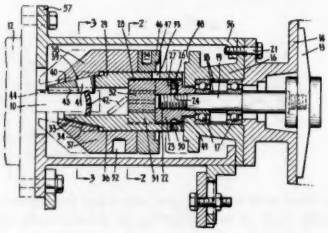
Claims priority, application Australia, Jan. 19, 1973, 1967/73

Int. Cl. F16d *3/22*

U.S. Cl. 64—16 **12 Claims**

1. A drive coupling comprising a body, a shaft mounted for rotation in the body, first coupling means on one end of the shaft, second coupling means axially orientated with respect

to the first coupling means, drive transmitting means between the first and second coupling means to transmit driving motion from one to the other, shaft engaging means on said second coupling means, releasable locking means to releasably lock said first and second coupling means together, adjustable



aligning means axially movable on the second coupling means and having shoulder means on a radial surface thereof engagable with complementary shoulder means on said body to releasably align the second coupling means relative to the body, and locating means mounting said body to the frame of driving or driven apparatus.

3,868,832

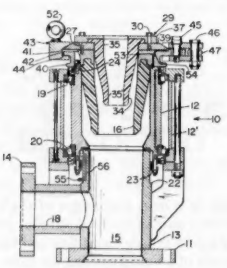
ROTARY DRILLING HEAD ASSEMBLY

Morris S. Biffle, 105 Cielo Vista, Odessa, Tex. 79761

Filed Mar. 8, 1973, Ser. No. 339,037

Int. Cl. F16d *3/06*

U.S. Cl. 64—23.5 **12 Claims**



1. A rotary drilling head assembly for well bore forming operations comprising a stationary housing, a seal assembly supported by the stationary housing; said seal assembly comprising a rotatable sleeve member, a stationary sleeve member at least partially surrounding the rotatable sleeve member so that a chamber is provided between said stationary sleeve member and said rotatable sleeve member, bearing means interposed between said stationary sleeve member and said rotatable sleeve member and disposed within the chamber;

sealing means engaged with said rotatable sleeve member and said stationary sleeve member for precluding leakage of fluid through said chamber;

a stripper mount means, a first stripper means for receiving a marginal length of a drillstring therethrough; said first stripper means being affixed to said stripper mount means;

means by which said stripper mount means is removably affixed to the uppermost end portion of said rotatable sleeve;

a second stripper means superimposed above and in axial alignment with the first recited stripper means; said first stripper means has a larger inside diameter relative to said second stripper means; and means removable mounting said second stripper means to said stripper mount means.

3,868,833

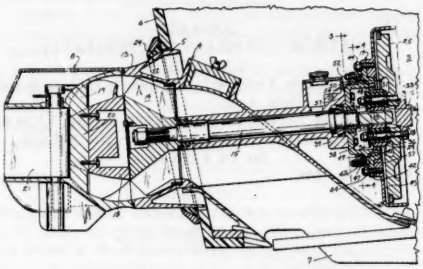
SHAFT COUPLING APPARATUS PARTICULARLY FOR MARINE INBOARD-OUTBOARD PROPULSION SYSTEMS

Gerald H. Noe, and William L. Woodfill, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 21, 1972, Ser. No. 317,198

Int. Cl. F16d *3/14*

U.S. Cl. 64—27 NM **11 Claims**



1. A coupling for connecting the engine shaft of an engine carried by a boat hull to the drive shaft of an aft mounted drive means; said coupling comprising a circular coupling plate having an inner shaft opening means for receiving and connection to one of said shafts with a plurality of equicircumferentially spaced interconnecting projections, said plate having a plurality of coupling openings, a flywheel secured to the second of said shafts and extending outwardly of said circular plate, a plurality of circumferentially distributed resilient mounts secured one each within each opening in said coupling plate, each of said resilient mounts having a resilient tubular bushing extending axially of the coupling plate with an outer diameter essentially corresponding to the opening and having an inner sleeve having end faces inwardly of the ends of the bushing, an annular clamping plate abutting the outer face of said bushings, clamping bolt means extending through said clamping plate and said sleeves and into said flywheel and forcing said clamping plate against said bushings and said bushings against said flywheel to compress said bushings and to deform said bushing outwardly of the annular plate and thereby provide a firm resilient interconnection of the first shaft to said mounting member.

3,868,834

PORTABLE KNITTING DEVICE FOR USE AT HOME OR IN LIKE PLACES

George Humphrey Tichenor, 545 Sutter St., San Francisco, Calif. 94108

Filed May 1, 1973, Ser. No. 356,124

Claims priority, application Great Britain, May 17, 1972, 23195/72

Int. Cl. D04b *3/00*

U.S. Cl. 66—1 A **2 Claims**

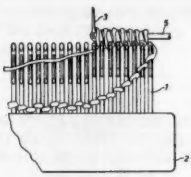
1. A knitting device comprising:

a needle bed;

a plurality of equidistantly spaced, substantially parallel needles in the needle bed; and

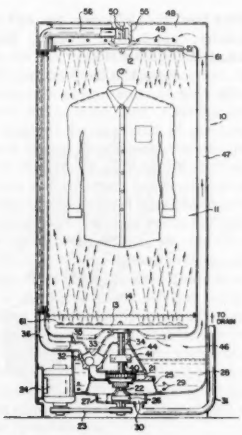
a sinker consisting of a shaft having a pair of opposed ends, a hook formed on one of said ends of said shaft, a bushing on said shaft in proximate relation to said hook, said bushing having a tapered leading thread, said thread having a larger root diameter adjacent said hook and a smaller root diameter as it approaches the other end of

said shaft, whereby upon rotation of said sinker and movement of said sinker along said needle bed, working



yarn or material can be sequentially drawn from between said needles.

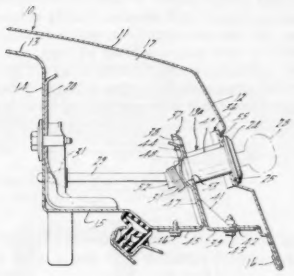
3,868,835
COMBINATION WASHER-DRYER DRIVE ARRANGEMENT
Leslie Todd-Reeve, Aylesbury, England, assignor to The Hoover Company, North Canton, Ohio
Filed Apr. 17, 1972, Ser. No. 244,828
Claims priority, application Great Britain, Apr. 27, 1971, 11717/71
Int. Cl. D06f *17/08*
U.S. Cl. 68—20 **10 Claims**



1. A washing machine having a compartment in which supported articles are to be washed and dried by being subjected to washing and rinsing liquid distribution and drying air flow, said compartment being in communication with a circulation pumping system which recirculates liquid drained from the articles,

the improvement comprising a reversible motor having first and second directions of rotation, a circulation pump in said circulation pumping system, said pump being driven by said motor so as to be effective when said motor is rotated in said first direction, and ineffective when said motor is driven in said second direction, and a fan for providing air flow distribution, said fan being positively driven only when said motor is driven in said second direction.

3,868,836
DECK LID LATCH AND LOCK ASSEMBLY
Louis A. La Roche, Cologne-Lindenthal, Germany, assignor to Ford Motor Company, Dearborn, Mich.
Filed Mar. 1, 1974, Ser. No. 447,447
Int. Cl. E05b *65/19*
U.S. Cl. 70—240 **6 Claims**



1. A deck lid latch and lock assembly for a vehicle deck lid having inner and outer spaced panels connected by a bridging panel forming a pocket in which a latch mechanism and a lock mechanism are housed in spaced relation to each other,

the latch mechanism being mounted on the inner panel with its latch element projecting through an aperture in the bridging panel in a keeper device engageable position,

the lock mechanism having an elongated and flanged housing at one end,

the housing extending inwardly into the deck lid pocket through an aperture in the outer panel to a depth permitted by abutment of its flange with the outer surface of the outer panel,

a key cylinder mechanism mounted in the housing having at its outer end a key receiving slot facing outwardly of the outer panel,

and coupling means operatively connecting the key cylinder mechanism at its inner end to the latch mechanism within the deck lid pocket,

wherein the improvement comprises:

a combination bracket-shield mounted on the bridging panel and having an aperture through which the end of the lock mechanism housing opposite its flanged end projects,

a first retention clip having interlocked engagement with the end of the housing projecting through the bracket-shield,

the first retention clip engaging the lock mechanism to prevent twisting movement of the housing relative to the outer panel and having abutting relation to the bracket-shield to prevent longitudinal withdrawal of the housing from the support bracket aperture and the outer panel aperture,

and a second retention clip having inerlocked engagement with the lock mechanism between the bracket-shield and the outer panel,

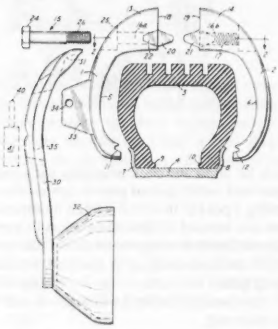
the second retention clip abutting the inner side of the outer panel to provide seal pressure between the lock mechanism housing flange and the outer surface of the outer panel.

3,868,837
WHEELOCK FOR VEHICLE WHEELS
Charles A. Quimby, 403 S. Autry, Lafayette, Colo. 80026
Filed Oct. 3, 1973, Ser. No. 403,070
Int. Cl. B60r *25/00*; **E05b** *73/00*
U.S. Cl. 70—259 **5 Claims**

1. Apparatus selectively lockable about a peripheral section

of a vehicle wheel, restraining vehicle wheel rotation and restraining wheel removal from the vehicle axle comprising

a. a pair of mating members encompassing, in mated condition, a peripheral portion of a wheel-mounted tire, said mating members contacting the rim of the wheel on which it is mounted so as to restrain wheel rotation, said mating members having a bolt-accepting passage and each having at least one generally flat mating face arranged perpendicular to said bolt-accepting passage, the mating face of each member having at least one protruding tab and one receiving recess arranged on opposite sides of said bolt-accepting passage, the corresponding tab and recess on said mating faces are arranged to interfit and align with each other when said members are in a mated condition with said mating faces in contact;



b. means selectively securing said mating members in mated condition, said securing means having a bolt means extending through said bolt-accepting passage and arranged whereby when said bolt means is tightened, said mating members will be securely clamped to the rim of said wheel; and

c. arm means extending radially of said wheel and being selectively mountable and lockable at a point intermediate to its ends along one outerside of one of said mating members, said arm means being arranged whereby one end is disposed adjacent said mating member to cover at least a portion of said securing means and the opposite end having a cover means arranged to at least conceal a portion of a means securing the wheel to said vehicle axle to prevent removal of the wheel from said axle.

3,868,838

CYLINDRICAL LOCK COMBINATION CHANGER

Earl L. Zimmerman, Indianapolis, and Ronald F. Homeier, Plainfield, both of Ind., assignors to Code Key International Corporation, Indianapolis, Ind.

Filed Nov. 23, 1973, Ser. No. 418,471

Int. Cl. E05b *25/00*

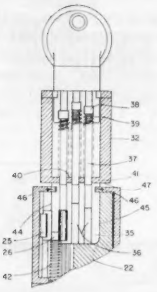
U.S. Cl. 70—383 **7 Claims**

1. An adaptor insertable into a first keyhole of a cylindrical combination lock to change the combination thereof corresponding from an original longitudinally ribbed key to a different longitudinally ribbed key comprising:

a main body having a blank key fittable into said keyhole and a key receiving housing attached to said blank key, said housing having a second keyhole sized to receive said original key and subsequent to the removal of said original key to then receive said different key, said blank key having at least one side with channels extending longitudinally thereon;

a plurality of bits slidably mounted in said channels;

a plurality of pushers connected to said bits and projecting into said second keyhole to contact ends of ribs of a ribbed key inserted into said second keyhole; and,



means within said main body and in contact with said pushers being operable to position said bits on said blank key in a manner identical to the positioning of ribs on a ribbed key inserted into said second keyhole.

3,868,839

SHAPING MACHINE WITH SERVO-ASSISTED FORMING TOOL

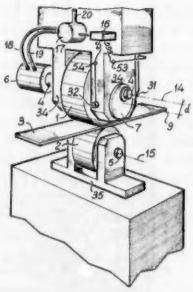
Michel Maurice Gerard Sentourens, St. Nazaire, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Dec. 21, 1973, Ser. No. 427,228

Claims priority, application France, Dec. 29, 1972, 72.46898; Dec. 4, 1973, 73.43157

Int. Cl. B21c *5/06*

U.S. Cl. 72—21 **17 Claims**



1. A shaping machine comprising two rotatable forming rolls with parallel axes between which items to be shaped such as sheet metal or panels are inserted and moved by a force external to the machine, said forming rolls being pressed against each other by a force which subjects the workpiece therebetween to a strain from which ensues a shaping thereof, at least one of said two forming rolls being mechanically connected to a motor associated with regulating means, said motor imparting to said forming roll a torque the magnitude of which is a direct function of the external force applied to the workpiece, said regulating means including an amplification chain comprising a power amplifier that energizes the motor as a function of the output signal from a differential amplfier across the inputs of which is connected a sensing device for measuring the magnitude and direction of the external force applied to the workpiece, shaping means in which a forming-roll shaft connected to said motor rotates in movable

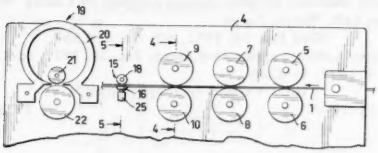
bearings which effect small displacements, the magnitude and direction of which are measured by the sensing device and as a result of which the forming-roll axis accompanies the motions of the workpiece in response to the external force, said bearings moving away in such cases from a resting position in which the plane containing the forming-roll axes is parallel to the direction of the force which presses said forming rolls against each other.

3,868,840

TUBE MADE OF METAL STRIP BY MEANS OF SPIRAL SEAMING AND A DEVICE INTENDED FOR A SPIRAL SEAMING TUBE MACHINE FOR THE PRODUCTION OF SUCH A TUBE

Arne Olavi Ekroos, Helsinki; Matti Kaarlo Merikoski, Westend, and Bernhard Erik Oswald Levander, Helsinki, all of Finland, assignors to Oy Nokia Ab, Helsinki, Finland

Filed Feb. 15, 1974, Ser. No. 443,036
Claims priority, application Finland, Feb. 9, 1971, 344/71
Int. Cl. B21c *37/12*
U.S. Cl. 72—49 **1 Claim**



1. A machine for forming a spirally seamed tube from a continuous metal strip formed with at least one integral stiffening ridge between the spiral seams formed at the longitudinal edges of said metal strip, said machine comprising in combination a machine frame, pairs of pre-bending rollers rotatably mounted in said frame and positively driven to feed the metal strip in the longitudinal direction thereof between said pairs of rollers and to form a pre-bent ridge in said metal strip, a pair of further rollers positioned after said pre-bending rolls with respect to the advancing direction of said metal strip and rotatably supported by said frame, the circumferential edges of said further rollers being mutually spaced to engage said pre-bent ridge from opposite sides thereof and to flatten said ridge only at the foot of said ridge in order to form in cross-section a loop, a space being formed between the walls of said ridge inside said loop, and further comprising a guiding unit for spirally bending the metal strip into a spiral tube the axis of which extends transversely with respect to said advancing direction of said metal strip and seaming means for joining together adjacent edges of the metal strip of said spirally bent tube to form said spiral seams.

3,868,841

PROCESS AND MEANS FOR MAKING THICK END TUBE AND PIPE

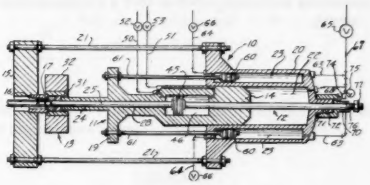
Richard Couchman, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 30, 1973, Ser. No. 346,264
Int. Cl. B21c *25/08*
U.S. Cl. 72—260 **4 Claims**

1. In the operation of an extrusion press, a die having an extrusion opening therein, a container adapted to sealably close with said die, a ram adapted to move axially toward said die and into said chamber, and a mandrel having a stepped tip and being mounted to move axially within said ram and also into said chamber, the method of extruding a tube having a wall which is relatively thick at one location along its length, and relatively thin at another location along its length, which method comprises:

placing a charge of extrudable material in said container, positioning one of the stepped portions of the mandrel within the die opening,

moving the ram forwardly into the container and toward the die, thereby extruding some of such charge through said die opening to form a wall of one thickness on the extruded tube,



shifting the mandrel forwardly with reference to the die opening to form a wall of a different thickness on the extruded tube,

continuing the extrusion during the forward shifting operation of the mandrel,

stopping the forward movement of the ram and using only the mandrel to extrude material during the change over from extruding one wall thickness to another, and

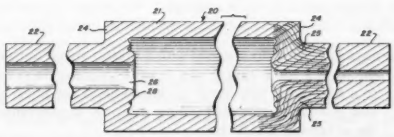
maintaining an extrusion ratio of unity during such forward shifting operation.

3,868,842

METHOD OF MAKING LAP PIN

William Edward Anthony, Lynwood Rd., Gastonia, N.C. 28052

Division of Ser. No. 188,193, Oct. 12, 1971, Pat. No. 3,807,649. This application Jan. 28, 1974, Ser. No. 436,872
Int. Cl. B21k *1/02*
U.S. Cl. 72—367 **3 Claims**



1. A method of forming a lap pin, comprising the following steps,

cutting a piece of high carbon tubular steel to preferred length,

heating both ends to forging temperature,

swaging both ends partially down to size, but retaining a hollow bore in the thus partially sized ends,

reheating the partially swaged ends to forging temperature, thereafter swaging the ends to correct dimensions,

and heat treating the resultant in a carburizing atmosphere.

3,868,843

METHOD OF ANALYZING ANGULAR MOTION OF A POINTER OF AN ALTIMETER

Paul W. Moseman, Jr., Davenport, Iowa, assignor to The Bendix Corporation, South Bend, Ind.

Filed Apr. 23, 1973, Ser. No. 353,827
Int. Cl. G01l *27/02*
U.S. Cl. 73—1 R **9 Claims**

1. A method of analyzing the angular displacement of a rotatable indicator with respect to an arcuate scale during a

predetermined time period for estimating the accuracy of said indicator, comprising the steps of:

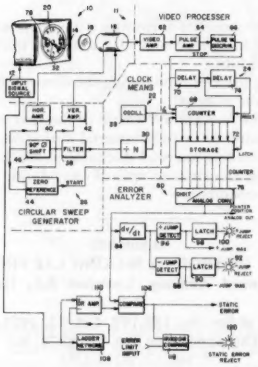
applying a uniform input signal to rotate said indicator;

scanning said indicator with a circular sweep generator having a selected resolution at a rate which uniformly divides the arcuate scale into segments;

recording each interception of the indicator and a circular trace within said segments;

counting the time period between a scan zero reference and each interception;

converting each time interval into a corresponding output signal;



comparing the output signal with a master signal derived by measuring the rotation of a master indicator in response to a sequential test signal to determine if the input signal will produce a corresponding uniform displacement of the rotatable indicator;

detecting the duration and effect of any intermittent delay in the rotation of the rotatable indicator to determine if a stop-jump relationship exists between the input signal and the output signal;

identifying any variance between the output signal and the master signal; and

exhibiting said variance on a display to inform an operator a correction is required in said rotatable indicator.

3,868,844

DYNAMIC ARTERIAL BLOOD PRESSURE SIMULATOR

Burton Klein, 4 Ellsworth Ave., Cambridge, Mass. 02139

Filed May 11, 1973, Ser. No. 359,532

Int. Cl. G01l *27/00*

U.S. Cl. 73—4 R **8 Claims**

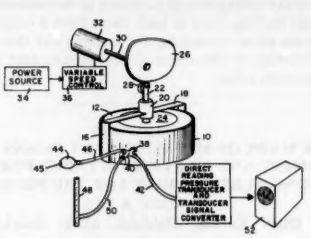
1. A dynamic arterial blood pressure simulator comprising in combination:

a. a pressure chamber having an outlet port;

b. a flexible member within one wall of said chamber;

c. cam means in communication with said flexible member for depressing said member into said chamber, said cam means having a shape proportionate to at least one hypothetical arterial blood pressure cycle; and

d. drive means for rotating said cam for producing a variable pressure proportionate to said cycle at said outlet port.



3,868,845

APPARATUS FOR MEASURING A DIFFERENCE IN TIME INTERVALS OF A TIMEPIECE

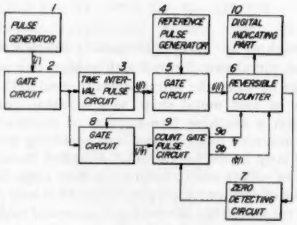
Hiroshi Shimizu, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

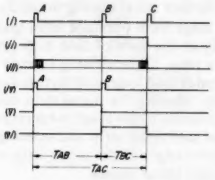
Filed Jan. 10, 1972, Ser. No. 216,531

Claims priority, application Japan, Jan. 20, 1971, 46-1228; Feb. 5, 1971, 46-4286

Int. Cl. G04d *7/12*; **G01r** *29/02*

U.S. Cl. 73—6 **2 Claims**





1. Apparatus for measuring the out-beat of a watch, clock or the like by measuring the difference between the duration of a first pulse interval of an impulse series produced by the watch, clock, or the like and a second pulse interval of said same impulse series comprising,

a reversible digital counter,

gating means at times responsive to said impulse series and at times to the attainment by said counter of a zero count for selectively producing a positive count gate pulse and a negative count gate pulse,

and said single source of trigger pulses applied to said counter and occurring throughout the total durations of said first and second pulse intervals,

said gating means producing said positive count gate pulse and controlling said counter to count said trigger pulses

in a positive sense during said first pulse interval and producing said negative count gate pulse and controlling said counter to count said trigger pulses in a negative sense during said second pulse interval,

said gating means further being responsive to the attainment by said counter of a zero count during said second pulse interval for again producing said positive count gate pulse and controlling said counter to count said trigger pulses in a positive sense over the remainder of said second pulse interval,

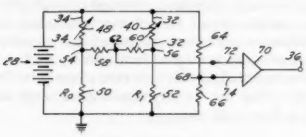
whereby the count in said counter at the end of said second pulse interval corresponds to the difference in durations of said first and second pulse intervals irrespective of which is the longer.

3,868,846

CIRCUIT FOR CONVERTING A TEMPERATURE DEPENDENT INPUT SIGNAL TO A TEMPERATURE INDEPENDENT OUTPUT SIGNAL

Toshimoto Kushida, Dearborn, and Eleftherios M. Logothetis, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed July 2, 1973, Ser. No. 375,993
Int. Cl. G01n *27/12, 33/22*
U.S. Cl. 73—27 R **7 Claims**



1. In combination with a resistive-type exhaust gas sensor for sensing the partial pressure of the oxygen content of the gas, a circuit connected to a source of electrical energy for reducing the dependency of the output signal upon the temperature of the sensor environment comprising:

first resistance means electrically in series with the sensor forming a current flow path for the source;

a first reference junction being formed between the sensor and said first resistance means;

a heater means operatively associated with the sensor;

second resistance means electrically in series with said heater means forming a second current flow path in parallel with the first current path, a second reference junction being formed between said resistance means and said heater; and

a first voltage divider means having an intermediate sensing terminal interconnecting said first and second reference junctions which is a selected fraction of the voltage differential between said first and second junctions.

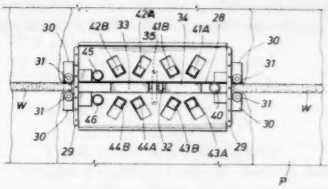
3,868,847

SYSTEM AND APPARATUS FOR INSPECTING ELONGATED WELDS

Walter A. Gunkel, 6515 Moss Oak, San Antonio, Tex. 78227

Filed Dec. 4, 1972, Ser. No. 311,800
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.8 S **12 Claims**

1. Ultrasonic apparatus for inspecting an elongated butt weld comprising, in combination: an inspection head adapted to be moved along and adjacent to the weld; a longitudinal wave ultrasonic transducer mounted on said inspection head and adapted to be positioned on said weld to move along its length for inspection through a substantial part of the heart of the weld; a plurality of shear wave ultrasonic transducers mounted on said inspection head to be positioned on each side of the weld to provide for inspection of the boundary zone of the weld, and means on the inspection head to restrain movement thereof to be longitudinally along the elongated weld without any substantial movement laterally of the weld.

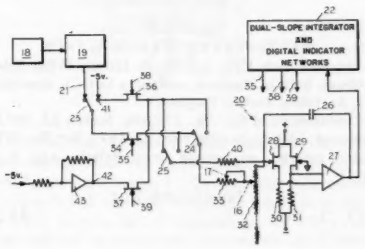


3,868,848

SOLID STATE DIGITAL STRAIN INDICATORS

Donald A. Senour, Blaisdell Dr., Carlisle, Mass. 01741

Filed Sept. 14, 1972, Ser. No. 289,072
Int. Cl. G01b *7/16*
U.S. Cl. 73—88.5 R **9 Claims**



1. Electrical indicating apparatus accommodating signal inputs from input transducers having different sensitivities, comprising a dual-slope integrator wherein input signals are periodically up-integrated for a predetermined time and then down-integrated until the integrator output is restored to a predetermined signal level, a sensitivity-adjustment variable resistance and a fixed resistance, means providing visual displays responsive to down-integration times of said integrator, first means for applying a first reference signal as input to said integrator through said fixed resistance during up-integration times thereof and a second signal to said integrator through said variable resistance as a reference during alternate down-integration times thereof, and second means for applying signals from a transducer as input to said integrator through said variable resistance during up-integration times thereof and one of said first and second signals to said integrator through said fixed resistance as a reference during alternate down-integration times therof, whereby adjustment of said variable resistance to cause said visual display means to display the known value of sensitivity of the transducer during operation of said first means results in display of measurements compensated to account for sensitivity of the transducer during operation of said second means.

3,868,849

DUCTILITY TESTER

Csaba K. Hunyar, Sunland, Calif., assignor to United Artists Music and Records Group, Inc., Los Angeles, Calif.

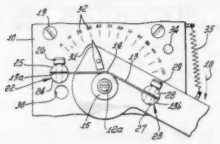
Filed Aug. 16, 1973, Ser. No. 388,727
Int. Cl. G01n *3/20, 3/28*
U.S. Cl. 73—100 **10 Claims**

1. In a specimen strip ductility tester, the combination comprising

a. a support,

b. post means projecting at one side of the support and having a circularly curved surface presented for engagement by the strip,

c. a member pivotally connected to the support, said member comprising an arm having a pivot axis, the post means



carried by the arm to rotate therewith in alignment with said axis and so the axis is apporixmately at the center of said curved surface, and

d. holder means on the support and on said member to grip and effect stretch wrapping of the strip partially about said curved surface in response to relative forward pivoting of said member with respect to the support.

3,868,850

MULTI-STRAND STRESSING JACK

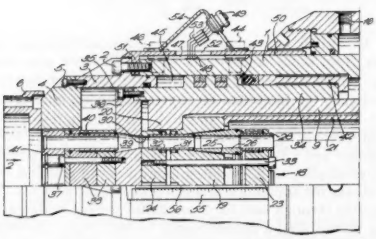
John Davison, Ash Vale, and Hugh Jeremy Willis Edwards, Cobham, both of England, assignors to CCL Systems Limited, Surbiton, Surrey, England

Continuation of Ser. No. 236,858, March 22, 1972, abandoned. This application Nov. 27, 1973, Ser. No. 419,389

Claims priority, application Great Britain, Apr. 1, 1971, 8391/71

Int. Cl. G01l *5/04*

U.S. Cl. 73—143 **13 Claims**



9. A stressing jack as claimed in claim **1**, including strain gauge means attached to said main casing and being responsive to straining of said main casing, and means for transmitting from said strain gauge means and to a remote location signals indicating the stress applied to said wires or strands.

3,868,851

APPARATUS FOR DETERMINING THE TENSILE STRESS IN A CONTINUOUSLY MOVING WEB OF MATERIAL

Eberhard Breyer, Herrenberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

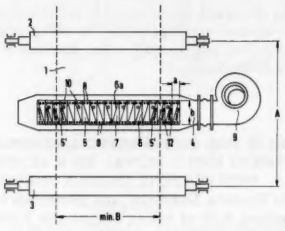
Filed Nov. 16, 1973, Ser. No. 416,348

Claims priority, application Germany, Nov. 22, 1972, 2257253

Int. Cl. G01l *5/08*

U.S. Cl. 73—144 **6 Claims**

1. An apparatus for measuring the tensile stress of a continuously moving gas and liquid impermeable web of material, including a pair of rollers disposed therebeneath for deflecting the web of material, an elongated enclosed channel disposed between the rollers below the web having an axial length at least as great as the width of the web and an opening disposed therebeneath, a plurality of first orifices disposed in the channel opening, means coupled to the channel for supplying a gas thereto and to said orifices under contant pressure and thereby forming a static pressure cushion between the web and the channel opening, and means disposed in the channel opening for measuring the pressure of the cushion, the improvement comprising:



a plurality of triangular shaped chambers, axially disposed in series in said channel opening, and each including a partition member disposed parallel to the direction of movement of the web which forms at least one wall of each of said chambers, selected ones of said chambers at the axial ends of said channel including a plurality of additional orifices communicative with said channel and spaced apart from said first orifices; and

means, coupled to said selected chambers, for selectively controlling the supply of said gas to said additional orifices from said channel.

3,868,852

VOLUME GAS METER

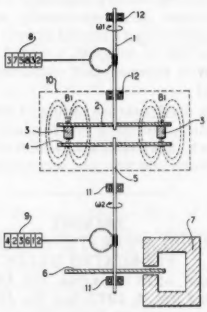
Sylvain Janssen, Paris, France, assignor to Compteurs Schlumberger, Hauts de Seine, France

Filed May 18, 1973, Ser. No. 361,693

Claims priority, application France, May 19, 1972, 72.18005

Int. Cl. G01f *1/02*

U.S. Cl. 73—233 **19 Claims**



1. Volume meter for producing more accurate representations of the volume flow rate of a metered compressible fluid, comprising a first shaft for rotating at a first speed representative of volume flow rate of the metered fluid, a second shaft, slip connecting means between the first shaft and the second shaft for causing the second shaft to rotate at a second speed functionally related to the first speed, and means for braking the second shaft, the slip connecting means and the braking

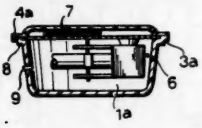
means being such that the second speed varies in reverse to the temperature of the metered fluid to compensate for any variation of the first speed as a result of a temperature caused density variation of the metered fluid, whereby the second speed provides a representation of the flow rate of the metered fluid which is corrected for variations of density thereof with temperature changes.

3,868,853

CASING FOR LIQUID-FILLED DEPTH GAUGE

Carlo Alinari, Corso Vittorio Emanuele 200, Turin, Italy

Filed July 7, 1972, Ser. No. 269,675
Int. Cl. G01f *23/14*
U.S. Cl. 73—300 **5 Claims**



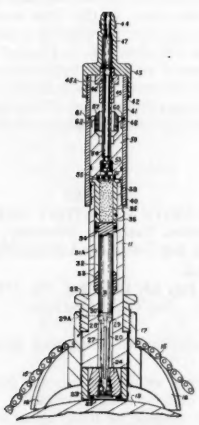
1. A sealed casing for a liquid filled depth gauge comprising a concave shell element of flexible, transparent, plastic material, a transverse flexible plastic cover element for said concave shell element, both of said elements having complementary peripheral edges sealingly engaged with each other, a transverse diaphgram having indicia thereon, means mounting said diaphragm within said peripheral edges of said element of said sealed casing in substantially parallel spaced relation to said transverse element, a pressure responsive instrument, and means for mounting said instrument having indicating means within said casing on said diaphragm.

3,868,854

SAMPLING MECHANISM

Bruce W. Travor, Holland, Pa., and Lennord L. Pitney, Park Rapids, Minn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 2, 1973, Ser. No. 376,013
Int. Cl. G01n *1/22*
U.S. Cl. 73—421.5 **7 Claims**



1. In a sampling mechanism having a grooved needle for sampling the contents of a container secured to said mechanism, a first piston responsive to fired cartridge gases for driving said needle in a first direction toward said container, and a first shock absorber for retarding motion of said first piston after predetermined movement thereof in said first direction.

a compensator piston responsive to fired cartridge gases for movement in a direction opposite to said first direction, a second shock absorber for retarding motion of said compensator piston after predetermined movement thereof in said opposite direction,

extraction orifice means in said needle, and

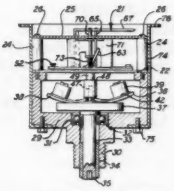
vulcanized rubber sealing said orifice means.

3,868,855

TACHOMETER INSTRUMENT

Frank W. Murphy, Jr., Tulsa; Lewis M. Carlton, Jenks, and Troy L. Teague, Broken Arrow, all of Okla., assignors to Frank W. Murphy Manufacturer, Inc., Tulsa, Okla.

Filed Jan. 3, 1974, Ser. No. 430,412
Int. Cl. G01p *3/18*
U.S. Cl. 73—530 **8 Claims**



1. A tachometer comprising a primary support, a centrifugal fly ball assembly mounted for rotation on said support and adapted for connection with a rotary element of an engine or the like, said fly ball assembly including a rotary plate element having a flat face, a pair of opposed curved rocker plates engaging said flat face rockably, a bowed spring attached to the rotary plate element and also attached to the rocker plates and tensioned to maintain the exterior ends of the rocker plates elevated and their interior ends depressed relative to said flat face, fly ball masses attached to the rocker plates, a reciprocatory drive button in engagement with the interior ends of the rocker plates and adapted to be shifted thereby when said interior ends are elevated in response to an increase in speed of rotation of the fly ball assembly, a support plate attached to said primary support in spaced relation to the rotary fly ball assembly, a pivoted tachometer pointer on said support plate adapted to sweep over a dial having a scale indicating rotational speed, and a drive mechanism for said pointer on said support plate including a crank element, a movement pin for the crank element arranged in engagement with said drive button to be actuated thereby, said support plate having a clearance opening for the movement pin, and a resilient member attached to said movement pin and raised and lowered by displacement of the movement pin and underlying said crank element and contacting the same.

3,868,856

INSTRUMENTATION FOR MEASUREMENT OF AIR-CRAFT NOISE AND SONIC BOOM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Allan J. Zuckerwar, Youngstown, Ohio

Filed Apr. 25, 1973, Ser. No. 354,408
Int. Cl. G01l *11/00*
U.S. Cl. 73—557 **6 Claims**

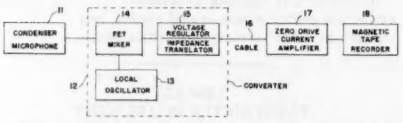
1. Instrumentation for measuring aircraft and sonic boom comprising:

a condenser microphone means for varying a capacitor in accordance with the noise picked up by said microphone means;

an oscillator for generating a carrier frequency;

a tank circuit including said capacitor tuned to said carrier frequency;

a field-effect transistor means connected to receive the outputs from said oscillator and said tank circuit for



producing an electrical signal containing said carrier frequency and the variations of said capacitor; and

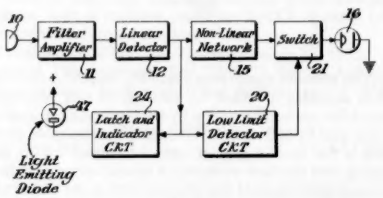
means for removing said carrier frequency from said electrical signal to obtain an electric current that is proportional to the sound pressure at the microphone.

3,868,857

AUDIO DOSIMETER

Edward L. Maddox, Lexington, and Robert A. Pease, Wilmington, both of Mass., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Nov. 16, 1972, Ser. No. 307,082
Int. Cl. G01h *5/00*
U.S. Cl. 73—558 **6 Claims**



1. An audio dosimeter for individual use comprising, in series circuit in the order recited, electronic microphonic sound sensor means,

a filter-amplifier provided with a feedback circuit receiving the a-c voltage output of said sound sensor means, said filter-amplifier comprising an operational amplifier connected in circuit with a plurality of a-c filter networks each having individual band pass characteristics preselected to collectively interact to shape said a-c voltage output during transmission by said filter-amplifier to conform to the pattern of a preselected weighting network incorporating in said a-c voltage output the otolaryngologically (and psychologically) harmful contribution of ambient sound frequency,

linear detector means rectifying said a-c voltage output from said filter-amplifier, said linear detector means incorporating a pair of oppositely connected diodes as rectifying elements, and said filter amplifier feedback circuit incorporating a pair of oppositely connected diodes preselected to compensate the forward voltage drops of said pair of diodes in said linear detector means and an impedance preselected to provide the desired linearity of rectification for small signals connected between signal ground and the junction of said compensating diodes on the feedback delivery side of said compensating diodes,

a non-linear network shaping the d-c output current from said linear detector to the function required to produce a substantially straight line of correct slope in a plot of decibels referred to a preselected current level versus sound energy input level in decibels, and

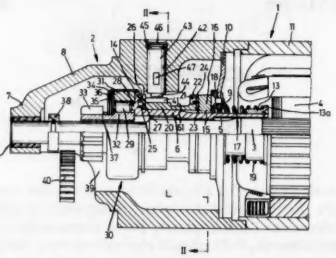
an electrochemical integrating cell receiving the output current from said non-linear network measuring sound exposure in terms of sound pressure with weighted frequency and time of exposure conjointly.

3,868,858

STARTER FOR INTERNAL COMBUSTION ENGINES

Wolfgang Reichardt, Sevres; Lucien Blanchard, Mitry, and Jean Denamps, Asnieres, all of France, assignors to Robert GmbH Bosch, Stuttgart, Germany

Filed Feb. 7, 1974, Ser. No. 440,227
Claims priority, application Germany, Feb. 9, 1973, 2306364
Int. Cl. F02n *11/00*
U.S. Cl. 74—7 R **17 Claims**



1. In a starter for an internal combustion engine having a torque-receiving first gear, a combination comprising a motor having a drive shaft rotatable in a predetermined direction; operating means actuatable to start said motor; a second gear rotatably mounted on and movable axially of said shaft in a first direction from a disengaged first position to a second position of engagement with said first gear and in a second direction back to said first position; a shifting sleeve surrounding said shaft; an overrunning clutch mounted on said shaft and arranged to rotate said second gear in response to rotation of said shaft and to permit said second gear to rotate relative to said shaft in said predetermined direction when said second gear is driven by said first gear at a speed exceeding the speed of said shaft; displacing means having portions provided on said shaft and on said sleeve for moving said sleeve axially in said first direction when said sleeve is held against rotation with said shaft; means for connecting said second gear and said clutch to said sleeve so that said second gear moves toward said second position in response to axial movement of said sleeve in said first direction; and means for holding said sleeve against rotation with said shaft; comprising a blocking member rotatably mounted on said sleeve, arresting means actuatable to interrupt the rotation of said blocking member, and brake means interposed between said blocking member and said sleeve.

3,868,859

POSITIVE DRIVE VIBRATORY MECHANISM

Louis Joseph Scerbo, Randolph Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 16, 1973, Ser. No. 379,584
Int. Cl. F16h *33/00*
U.S. Cl. 74—61 **2 Claims**

1. A vibrating mechanism comprising, in combination:

a housing;

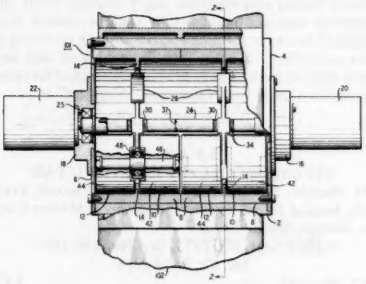
a bearing member within said housing providing a pair of substantially circular internal tracks;

a pair of rollers adapted for travel about respective ones of said tracks, said rollers being connected to a commmon axle;

an upstanding annular flange separating said tracks and providing a thrust shoulder for preventing sideways movement of said rollers because of thrust loads along said axle;

a drive shaft for driving said rollers about said tracks to generate vibratory movement of said mechanism; and

a rigid drive arm connecting said axle to said drive shaft, said arm including a bearing on one end thereof connecting said arm to said axle between said rollers to permit rotation of said axle with respect to said arm and to provide a balanced drive force for driving said rollers, said



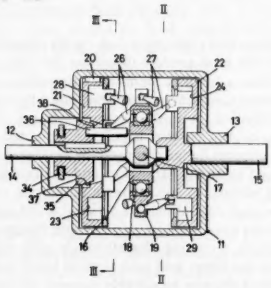
arm further including means for connecting said arm to said drive shaft in such a manner as to permit free movement of said arm along and transverse to said drive shaft while requiring said arm to rotate with said drive shaft, whereby said arm transmits rotational forces from said drive shaft to said rollers while isolating said drive shaft from radial and thrust loads on said rollers.

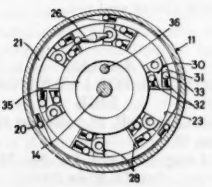
3,868,860

VARIABLE TRANSMISSION UTILIZING OSCILLATING LINKS AND ONE-WAY CLUTCHES

Bun-Ichi Ishimi, No. 5-15, 2 chome, Shimmori, Asahi-ku, Osaka, Japan

Filed Aug. 29, 1973, Ser. No. 392,468
Claims priority, application Japan, Aug. 30, 1972, 47-86956
Int. Cl. F16h *21/12*
U.S. Cl. 74—63 **3 Claims**





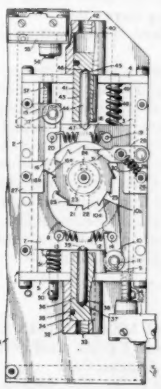
1. A variable speed transmission, comprising an input shaft, an output shaft coaxial with the input shaft, an inner wheel mounted on said input shaft for rotation therewith and for pivoting movement around an axis transverse to said input shaft, an outer wheel rotatably mounted on said inner wheel for rotation around the periphery of said inner wheel, an output disc fixed on said output shaft, a plurality of links each having one end pivotally mounted on said outer wheel and having the other ends in one way clutching engagement with said output disc and being inclined to the shafts, a fixable disc around said input shaft, means associated with said fixable disc for fixing it against rotation relative to said input shaft, a further plurality of links each having one end pivotally mounted on said outer wheel and having the other ends in one way clutching engagment with said fixable disc and being inclined to the shafts in the same direction as said firstmentioned plurality of links, the one way clutching engagement of said links with said discs being such as to produce clutching acting when said links are urged in a direction relative to the discs toward the obtuse angle between the links and the discs, and means engageable with said inner and outer wheels for pivoting them.

3,868,861

STEPPING MOTOR

Harold W. Scholin, Park Ridge, Ill., assignor to Scholin Industries, Inc., Chicago, Ill.

Filed Jan. 14, 1974, Ser. No. 433,102
Int. Cl. F16h *27/02*
U.S. Cl. 74—129 **24 Claims**



1. A stepping motor for driving a rotary member intermittently, comprising,

a. a supporting frame,

b. a driving member mounted on said frame for reciprocating movement in a linear path,

means for reciprocating said driving member,

d. a ratchet wheel mounted on said rotary member,

e. two pawls mounted on and reciprocable with said driving member in opposed relation to each other and in the plane of said ratchet wheel, whereby reciprocation of said driving member will advance said ratchet wheel one step for each direction of movement of said driving member, and

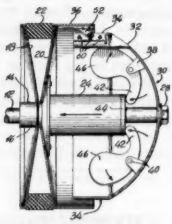
f. locking means associated with each of said pawls and cooperating therewith to restrain movement of said ratchet wheel in both directions when a pawl has completed its indexing movement.

3,868,862

EXPANSIBLE PULLEY WITH SPEED AND TORQUE RESPONSIVE MEANS

Georges Henri Bessette, 209 Boulevard des Seminaires, St. Jean, Comte Iberville, Quebec, Canada

Filed May 14, 1973, Ser. No. 360,341
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 E **19 Claims**



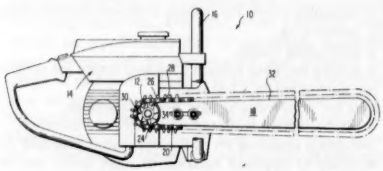
1. A V-belt pulley comprising:
a shaft;
a pair of axially spaced pulley plates carried by said shaft and defining therebetween a V-shaped belt groove, at least one of said pulley plates being axially slidable and rotatable on said shaft;
means connecting the other of said pulley plates to said shaft for rotating therewith;
a drive member fixed to said shaft adjacent said one pulley plate; and
at least one link pivotally connected at its ends to said one pulley plate and said drive member, respectively, whereby to drivingly connect said one pulley plate and said drive member, said link extending from said drive member to said one pulley plate in a direction generally tangential to said shaft whereby it may assume different angles relative to the axis of said shaft as said one plate slides toward or from said other plate and thereby transmit variable axial components of force between said drive member and said one plate in accordance with the axial spacing between said plates.

3,868,863

STAMPED SHEET METAL CHAIN SAW SPROCKET

William Lavier Gasner, Carson, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 304,313, Nov. 7, 1972, Pat. No. 3,786,687. This application Oct. 19, 1973, Ser. No. 404,645
Int. Cl. F16h *55/00*
U.S. Cl. 74—243 CS **10 Claims**



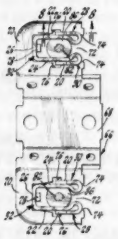
1. A sprocket for driving a chain of a chain saw comprising:
an annular stamped, sheet metal, chain engaging means for receiving a train of tangs on a saw chain comprising:
an annulus having an endless series of circumferentially spaced apart faces disposed in alternate relative protruded and depressed positions;
said faces disposed in said relative protruded position operable to define a first plane;
said faces disposed in said relative depressed position operable to define a second plane;
said first and said second planes being parallel and spaced apart a distance to define therebetween a generally planar saw chain travel path resistive of lateral saw chain displacement;
sidewall means extending an entire annular width of said annulus and contiguous with said protruded and depressed faces for forming a series of tang receiving pockets extending an entire annular width of said annulus and open at both ends to provide a sprocket for receiving successive tangs on a chain of a chain saw.

3,868,864

STEERING COLUMN MOUNTING PAD

Lyle H. Durkee, Hemlock, and Lehman J. Connell, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1973, Ser. No. 398,156
Int. Cl. B62d *1/16*
U.S. Cl. 74—492 **3 Claims**



1. In a vehicle body having a rod rigidly disposed thereon and a collapsible type energy absorbing steering column assembly including a bracket member, a mounting pad for disposition between said bracket member and said rod comprising, in combination, a body portion defining an aperture bounded by a pair of parallel legs interconnected at one end by a web, an integral flange disposed on the distal end of each of said legs and oriented parallel to and in juxtaposition with the outboard surface of the corresponding one of said legs, and means on each of said flanges defining a slot extending the full length of the corresponding one of said flanges, said body portion aperture receiving therethrough said rod for rigid attachment to the latter and said slots slidably receiving said bracket member thereby to slidably support the latter on said rod while preventing movement thereof in a direction parallel to the longitudinal axis of said rod.

3,868,865

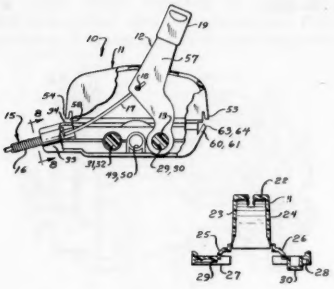
PUSH PULL CONTROL FOR LAWN MOWERS AND THE LIKE

James U. Neyer, Lake Bluff, Ill., assignor to Arens Controls, Inc., Evanston, Ill.

Filed Aug. 29, 1973, Ser. No. 392,429
Int. Cl. F16c *1/10*
U.S. Cl. 74—501 R **16 Claims**

3. A control for operating a Bowden cable or the like, comprising a housing and a lever, the housing including a two-sided cover member and first and second base members, each base member dependently hinged from a side of the

cover member and having at least one embossment formed to mate with an embossment on the other base member, the



embossments, when joined together, securing a portion of the lever at a pivot point within the housing.

3,868,866

TRANSMISSION CONTROL SYSTEM

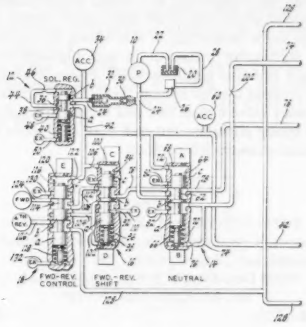
Carl A. Lentz, Mooresville, Ind., assignor to General Motors Corporation, Detroit, Mich.

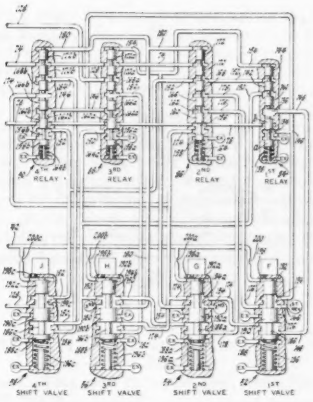
Filed Sept. 10, 1973, Ser. No. 395,621

Int. Cl. F16h *3/74*

U.S. Cl. 74—752 C **4 Claims**

3. A control for a multi-speed planetary gear transmission having a plurality of fluid operated selectively engageable drive establishing means for establishing drive ratios in the planetary gearing, said control comprising; pump means for providing a source of fluid pressure; first, second, third, and fourth relay valve means in fluid communication with said pump means and each being moveable to a spring set position and a pressure set position for controlling fluid from said pump means; first, second, third, and fourth shift valve means each being moveable to a spring set position and a pressure controlled position for controlling the engagement of first, second, third, and fourth of said drive establishing means respectively; first fluid passage means in fluid communication with said second relay valve means, said first, second and third shift valve means and said fourth relay valve means for providing pressurized fluid from said pump means through said second relay valve means when said second relay valve means is in the spring set position and providing an exhaust connection when said second relay valve means is in the pressure set position and for moving said fourth relay valve means to said pressure set position; second fluid passage means in fluid communication with said second shift valve means, said first and third relay valve means and the second drive establishing means for directing pressurized fluid in said first passage means to said first and third relay valve means to control movement thereof to said pressure set position, and to the second drive establishing means for controlling engagement thereof when said second shift valve means and second relay valve means are in the spring set position and for permitting exhausting of the pressurized fluid therein to control movement of said first and third relay valve means to the spring set position and for controlling the engagement pressure of the second drive establishing means when said second shift valve is in said pressure controlled position; third passage means in fluid communication with said first shift valve means and said first relay valve means and being in fluid communication with said first passage means when said first shift valve means is in said spring set position and to exhaust when said first shift valve means is in said pressure controlled position for directing fluid pressure to and from said first relay valve means to control movement thereof between the spring set and pressure set positions thereof; fourth passage means in fluid communication with said third shift valve means and said third relay valve means and being in fluid communication with said first passage means when said third shift valve means is in the spring set position and to exhaust when said third shift valve means is in said pressure controlled position for directing fluid pressure to and from said third relay valve means to control movement thereof between the spring set and pressure set positions thereof; said first and second passage means remaining pressurized to prevent a ratio change from second to first





and from second to third when said second shift valve means is in said spring set position; said first and third passage means remaining pressurized to prevent a ratio change from second to first when said second shift valve means is in said pressure controlled position and said first shift valve means is in said spring set position; said first and fourth passage means remaining pressurized to prevent a ratio change from second to third when said second shift valve means is in said pressure controlled position and said third shift valve means is in said spring set position; fifth passage means in fluid communication with said third relay valve means, said second, third, and fourth shift valve means and said first relay valve means for providing pressurized fluid from said pump means through said third relay valve means when said third relay valve means is in said spring set position and for providing an exhaust connection when said third relay valve means is in the pres-

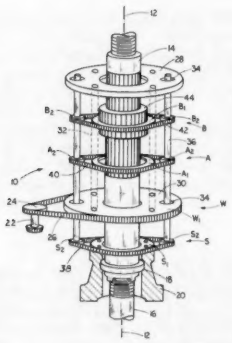
sure set position, and for moving said first relay valve means to said pressure set position when said third relay valve means is in said spring set position; sixth passage means for providing fluid communication between said third shift valve means and said third drive establishing means to establish engagement thereof, said second relay valve means and said fourth relay valve means; seventh passage means for providing fluid communication between said second shift valve means and said second relay valve means; and eighth passage means for providing fluid communication between said fourth shift valve means and said fourth relay valve means; said fifth and sixth passage means remaining pressurized to prevent a ratio change from third to second and from third to fourth when said third relay valve means and said third shift valve means are in said spring set positions; said fifth and seventh passage means remaining pressurized to prevent a ratio change from third to second when said third relay valve means and said second shift valve means are in said spring set positions and said third shift valve means is in said pressure controlled position; said fifth and eighth passage means remaining pressurized to prevent a ratio change from third to fourth when said third relay valve means and said fourth shift valve means are in said spring positions and said third shift valve means is in said pressure controlled position.

3,868,867

DIFFERENTIAL HARMONIC DRIVE

Pieter F. Hoos, Greensburg, Pa., assignor to Valve Systems International, Inc., Bala Cynwyd, Pa.

Filed Dec. 26, 1973, Ser. No. 427,634
Int. Cl. F16h *3/44, 57/10*
U.S. Cl. 74—773 **8 Claims**



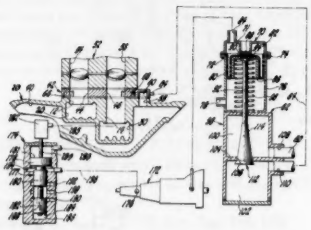
1. A differential harmonic drive comprising:
a rotary input member rotatable about an axis;
a shaft on said input member displaced from and parallel to said axis;
first and second planetary wheels rotatable together on said shaft;
first and second complementary wheels on said axis;
first and second engaging drive means between said first planetary and complementary wheels and between said second planetary and complementary wheels, respectively; and
means preventing rotation of said first complementary wheel;
said second complementary wheel being adapted to deliver a rotary output;
the rotary drive ratio between said first planetary and complementary wheels being different than that between said second planetary and complementary wheels.

3,868,868

TRANSMISSION CONTROLLED EMISSION CONTROL SYSTEM

Howard E. Chana, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1973, Ser. No. 403,929
Int. Cl. F02m *25/06*
U.S. Cl. 74—856 **4 Claims**



1. An exhaust gas recirculation control system for use on an internal combustion engine having an induction passage for air flow to the engine, an exhaust passage for exhaust gas flow from the engine and a recirculation passage having a first portion extending from said exhaust passage and a second portion extending to said induction passage comprising: exhaust gas recirculation control valve means including an inlet connected to the first portion of the recirculation passage and an outlet connected to the second portion of the recirculation passage, means forming an orifice between the inlet and outlet, valve means located within the orifice including a contoured wall portion thereon movable with respect to the walls of the orifice, a valve actuator including a variable volume hydraulic chamber having a signal port thereto, an automatic transmission including a hydraulic supply and a speed responsive governor means for producing a hydraulic signal related to vehicle speed, modulator valve means in said transmission including means sensing engine induction passage pressure and said governor signal for producing an output signal related to induction passage pressure and speed, and control valve means including means responsive to said governor pressure and said modulator valve output signal to produce an exhaust gas recirculation control signal responsive to induction passage pressure, means for directing said exhaust gas recirculation control signal to said signal port of said actuator means for positioning said valve means with respect to said orifice to control exhaust gas recirculation from the exhaust passage to the induction passage in accordance with pressure in the induction passage.

3,868,869

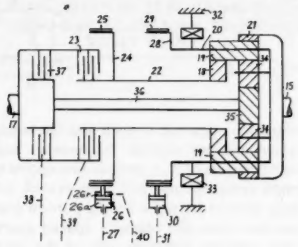
AUTOMATIC TRANSMISSION CONTROL SYSTEMS

Norman Hunt, and John Noddings, both of Cawston, England, assignors to Associated Engineering Limited, Warwickshire, England

Filed Jan. 8, 1973, Ser. No. 321,677
Claims priority, application Great Britain, Jan. 14, 1972, 1963/72
Int. Cl. B60k *23/02*
U.S. Cl. 74—866 **20 Claims**

1. For an automatic transmission including a frictionengaging element operable to change the drive ratio of the transmission, and a supply of pressurized fluid connected to the friction-engaging element, the friction-engaging element being actuated to effect a ratio change in dependence upon the supply of fluid thereto from said supply, a control system including a fluid-pressure actuated fluid-control valve having a valve housing, a cavity in said valve housing, a valve member located in said housing and movable therein, and fluid passage means connectable to said friction-engaging element and

pressurized fluid supply, said valve member being movable within with cavity between first and second positions, at one of which positions the valve member allows pressurized fluid to pass through said passage means to operate the friction-engaging element of the transmission in one direction, and at the other position the valve member vents the fluid to operate the friction-engaging element in the opposite direction, the control system further including an electrical solenoid-operated fluid-control valve for actuating said fluid-pressure actuated valve, fluid passage means connecting said solenoid-



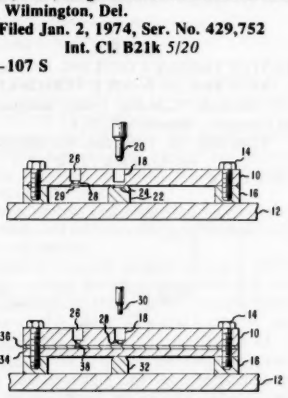
operated valve to the cavity of said fluid-pressure actuated valve, said solenoid-operated valve being operable to modify the pressure of pressurized fluid acting on said movable valve member, thereby to move the valve member in at least one direction, and electrical circuit means connected to the solenoid of said solenoid-operated valve to actuate the latter, said circuit being operable to supply a train of electrical pulses to said solenoid for a period after initiation of a change of drive ratio, the circuit means being adapted to vary at least one characteristic of the pulses in the train in dependence upon at least one variable operating parameter.

3,868,870

SPINNERET FABRICATION PROCESS

Robert Leroy Anthony, Martinsville, Va., and Samuel Francis Wray, Eden, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 2, 1974, Ser. No. 429,752
Int. Cl. B21k *5/20*
U.S. Cl. 76—107 S **4 Claims**



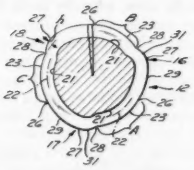
1. In a spinneret fabrication process that includes the steps of forming a plurality of counterbores in one side of a spinneret plate, punching a countersink in the bottom of each counterbore to a preselected depth of penetration; and punching through the countersink to form a capillary, the improvement comprising: positioning each of said counterbores over a pin anvil having a head with a central indentation therein; supporting the area surrounding said capillary with said anvil while extruding metal from the other side of the spinneret plate into said indentation during the punching of said countersink; removing the metal extruded into said indentation during said countersink forming step; supporting the other side of the spinneret plate with a layer of dead-soft metal having a thickness of from about 0.001 to about 0.003 inch and metal plate; replacing the indented head anvil with a flat head pin anvil; then positioning each countersink over the flat head pin anvil; and supporting the immediate area of each countersink with said flat head anvil during the punching of the capillary.

3,868,871

THREAD ROLLING DIES AND METHOD OF MANUFACTURING SAME

Herbert L. Yankee, North Royalton, and Richard H. Correte, Olmsted Falls, both of Ohio, assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 294,219, Oct. 2, 1972, Pat. No. 3,818,749.
This application Apr. 18, 1974, Ser. No. 462,135
Int. Cl. B21k *5/20*; **B21d** *17/00*
U.S. Cl. 76—107 R **2 Claims**



1. A method of forming thread rolling dies for rolling threads having a principal pitch diameter and a plurality of helically arranged arrays of thread form projections comprising producing thread form convolutions in the face of an unhardened die block wherein said convolutions extend diagonally across the block with the lead angle of the threads to be formed and are spaced in the lengthwise direction of said die block a distance substantially equal to π times said blank diameter of the blank to be threaded, thereafter pressing diagonally extending troughs in said convolutions without changing the shape thereof wherein said troughs are spaced in said lengthwise direction by a distance substantially equal to π divided by the number of arrays to be formed times the sum of said blank diameter and two times the depth of said troughs, and thereafter hardening said die block.

3,868,872

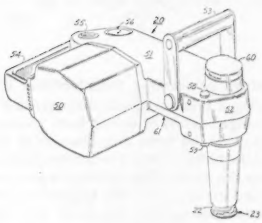
INTERNALLY REACTIVE STRUCTURAL JOINDER SYSTEM

George S. Wing, 605 Paseo del Mar, Palos Verdes Estates, Calif. 90274

Division of Ser. No. 179,799, Sept. 13, 1971, Pat. No. 3,759,119. This application Apr. 3, 1973, Ser. No. 347,580
Int. Cl. B25b , *13/46*
U.S. Cl. 81—52.4 R **2 Claims**

1. An internally reacting system for attaching one of its elements to another of its elements at a predetermined torque level and with a predetermined level of axial tensile preload, said system comprising a driver element, a fastener element having an axis, a workpiece element, and an interlinking element for interlinking the driver element and the workpiece element, said fastener element comprising a pin with a cylindrical shank having a central axis, a peripheral thread on said shank, and a collar including a peripheral flange, a peripheral bearing face on said peripheral flange, an axially-extending nose projecting beyond said bearing face bearing an outer wall, and an internal thread, said collar being adapted to be threaded and tightened onto the peripheral thread of the pin,

said workpiece comprising a body having a bounding surface and an aperture opening onto said bounding surface into which the shank fits, the peripheral thread projecting beyond said bounding surface, the pin being restrained against axial removal from the workpiece in the direction of the peripheral thread, said interlinking element comprising a washer including engagement surfaces, a central aperture at least in part defined by an inner wall to encircle and to pass the pin, and bearing surfaces to abut against the collar and against the workpiece when clamped between them by tightening the collar onto the pin, and the washer being restrained against rotation relative to the workpiece at least in part by frictional forces developed from compressive forces on the bearing surfaces, which forces are exerted on the washer by the collar through the said peripheral bearing face disposed on the said peripheral flange, the axially-projecting nose of the collar being adapted to be inserted into the central aperture of the washer, its outer wall having lateral dimensions such that when so inserted they are less than corresponding lateral dimensions of the inner wall, whereby the nose is radially spaced from the inner wall of the central aperture when the fastener element is fully assembled, at least the first three completely formed thread convolutions of the collar closest to the end of the nose most removed from the peripheral flanges lying axially within the nose, whereby to be located closer to



the workpiece than the bearing face on the collar, said driver element comprising a frame, engagement means on said frame to engage the engagement surfaces on the interlinking element and restrain the frame against rotation relative thereto, a wrench having a central axis of rotation rotatably mounted to the frame and adapted to engage the collar to tighten it onto the peripheral thread, a lever arm attached to the wrench, projecting therefrom and adapted to be driven in an arc around the said central axis to turn the wrench, fluid motor means mounted to the frame and connected to the lever arm at a distance from the central axis to cause said driving of the lever arm, a source of pressure-regulated fluid, and valve means admitting said fluid to the fluid motor under pressure so as to drive the same with a predetermined force against the lever arm of predetermined length, whereby the interlinking means restrains the frame against rotation while the wrench tightens the collar onto the pin, and the fluid motor means applies a regulated and substantially constant force and the wrench thereby applies an accurately regulated torque, all independently of other restraints on the frame or on the workpiece, the applied torque being determined and limited by the applied fluid pressure, and there being no freedom of movement of any portion of the driver element from the fastener element when they are engaged which would enable a differential velocity to exist.

3,868,873

END WRENCH WITH RATCHETING CAPABILITIES

James P. Evans, 3233 S.W. 23 St., Oklahoma City, Okla. 74107

Continuation-in-part of Ser. No. 351,252, April 16, 1973,. This application Nov. 23, 1973, Ser. No. 418,453

Int. Cl. B25b *13/02*

U.S. Cl. 81—119 **5 Claims**

1. A combination open end wrench and ratcheting wrench for a hexagonal member wherein the member has a width across opposing corners of A, a width across opposing sides of B, and a length along one side of C, the wrench comprising: a wrench body portion having a handle portion extending in one direction therefrom and opposed, spaced apart jaws extending in the opposite direction, one of the jaws being a torqueing jaw and the other being a backup jaw, the backup jaw having a planar working surface facing the torqueing jaw, the torqueing jaw having:

1. a breaking surface adjacent the body portion parallel the backup jaw and spaced from the backup jaw a distance slightly greater than B, the length of the breaking surface being greater than ½ C,

2. an arcuate surface adjacent said breaking surface, the distance of the arcuate surface from said backup jaw working surface as measured perpendicular the working surface being greater than A,

3. a ratcheting surface adjacent said arcuate surface, the ratcheting surface being parallel to said backup jaw working surface and spaced from it a distance slightly greater than B, the length of the ratcheting surface being less than ½ C, and

4. a retaining surface intersecting said ratcheting surface at an angle of 120°, the plane of the retaining surface intersecting the plane of backup jaw working surface at an angle of 60°.

3,868,874

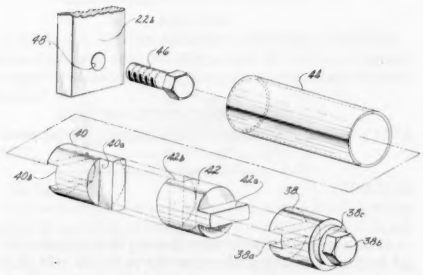
INSULATIVE TORQUE COUPLING ASSEMBLY FOR ELECTRICAL DEVICE TERMINALS

William F. Olashaw, Plainville, Conn., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,638

Int. Cl. B25b *13/06*

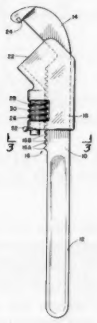
U.S. Cl. 81—121 R **10 Claims**



1. An insulative torque coupling assembly for use in making an electrical joint, secured by a bolt, said assembly comprising, in combination:

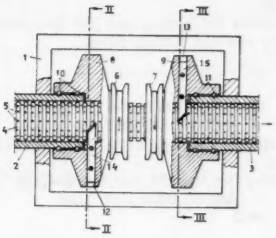
A. a metallic actuator couple having one end configured for engagement by a torquing tool;
B. a metallic bolt couple formed to engage the bolt;
C. an intermediate insulative couple having ends configured to interfit with ends of said actuator and bolt couples such as to transmit torque therebetween; and
D. means holding said couples in coaxial assembly.

3,868,875
QUICK ADJUSTABLE WRENCH
James P. Evans, 3233 S.W. 23 St., Oklahoma City, Okla.
Filed Sept. 17, 1973, Ser. No. 397,630
Int. Cl. B25b *13/16*
U.S. Cl. 81—158 **12 Claims**



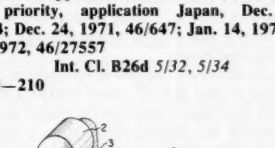
1. A quick adjustable wrench comprising:
a body having a handle at one end and a fixed jaw at the other;
a movable jaw slidably supported to said body providing movable spacing with said fixed jaw to receive variable sized members therebetween;
a rack portion formed on one or the other of said body and said movable jaw, the rack portion having spread-apart teeth, the floors of the valley areas between the teeth having irregular surfaces;
a rotatable eccentric axis supported by the other of said wrench body and said movable jaw, the axis being parallel to said rack portion;
a worm member rotatably supported by said eccentric axis, the worm member having a spiraled thread thereon, the outer surface of the thread being irregular; and
means for rotatably positioning said eccentric axis to three positions, in the first position the thread of said worm member being out of engagement with said rack portion whereby said movable jaw may be rapidly positioned relative to said fixed jaw, in the second position the thread of said worm member engaging the teeth of said rack portion whereby said movable jaw may be positioned relative to said fixed jaw by the rotation of said worm member, and in the third position the worm member being fully positioned towards said rack portion, said irregular outer surface on the worm member thread engaging the irregular floors of the valley areas between said teeth of said rack portion whereby said worm member is prevented from rotation to thereby lock said movable jaw relative to said body portion.

3,868,876
APPARATUS FOR MANUFACTURING PERFORATED TUBES
Erik Gustav Wendel Nordstrom, Box 84, 840 20 Ange, Sweden
Division of Ser. No. 181,540, Sept. 17, 1971, abandoned. This application Nov. 1, 1973, Ser. No. 411,724
Claims priority, application Sweden, Sept. 22, 1970, 12868/70
Int. Cl. B23b *21/00*
U.S. Cl. 82—20 **4 Claims**



1. Apparatus for forming perforations in the wall of a corrugated plastic tube having hollow projections provided thereon, said apparatus comprising a stationary frame, at least one guide sleeve fixed thereto and having an interior defining an internal guide for a tube to be fed therethrough, a drive wheel rotatively mounted on a terminal end of the sleeve and projecting axially outward therefrom, said wheel, beyond said terminal end, having a central bore forming a continuation of the guide defining interior of the sleeve and a guide for the tube passing therethrough, said wheel provided with drive means for rotating said wheel relative to said sleeve and the tube as the tube is moved through the sleeve, at least one knife blade positioned on the wheel outward of said terminal end and projecting into the bore of the wheel inward of the ends thereof in the path of the tube projections tangentially with the circumference of the tube, whereby movement of the tube through the terminal end of the sleeve and the wheel while simultaneously rotating the wheel will cause the blade to intersect the projections and cut the same away from the tube and expose the perforations.

3,868,877
FILM CUTTING DEVICE
Akira Shoji, Yokohama; Takao Toda; Kano Tanaka, both of Tokyo, and Takashi Hirashima, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 315,822, Dec. 18, 1972, Pat. No. 3,822,624. This application Feb. 4, 1974, Ser. No. 439,255
Claims priority, application Japan, Dec. 2, 1971, 46/104,324; Dec. 24, 1971, 46/647; Jan. 14, 1972, 47/6531; Mar. 17, 1972, 46/27557
Int. Cl. B26d *5/32, 5/34*
U.S. Cl. 83—210 **18 Claims**



1. A film cutting device comprising:
at least two detecting means for detecting film cutting marks disposed on a film spaced apart by a predeter-

mined distance, said two detecting means being arranged to be disposed such that when a mark or the projection thereof comes to be located near to one detecting means, the mark or the projection thereof adjacent to said mark or projection comes to be located near to the other detecting means spaced apart by the predetermined distance in the direction of feeding of the film;

a film cutting means for cutting film;

a control means for operating said cutting means when each of the detecting means generates their respective detecting signals;

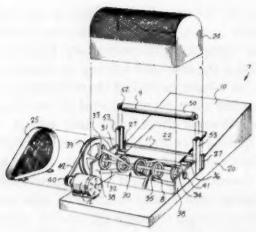
a feeding means for feeding said film into said detecting means and said film cutting means.

3,868,878

CUTTING DEVICE

Ben H. Peak, Holiday Hills Space 272, 2000 W. 92 Ct., Denver, Colo. 80221

Filed Oct. 9, 1973, Ser. No. 404,354
Int. Cl. B26d *5/20; 1/28*
U.S. Cl. 83—356.3 **4 Claims**



1. A cutting device, comprising:

cutting means;

means for positioning said cutting means at a cutting area for cutting material into strips at said area whenever said cutting means is being driven;

feed means for introducing material to be cut into said cutting area whenever said feed means is being driven, said feed means including a bottom rotatable feed roll and a top feed roll positioned above and contiguous to said bottom feed roll, said top feed roll being gravity biased towards said bottom feed roll so that different thicknesses of material can be readily handled;

means for driving said cutting means and said bottom feed roll of said feed means;

control means connected to said driving means for controlling driving of said cutting means and said bottom feed roll of said feed means, said control means including rate varying means for varying the relative driving rate between said cutting means and said bottom feed roll of said feed means to thereby readily adjust the width of said strips;

a feed table positioned forwardly of said cutting area and slanting downwardly theretoward; and

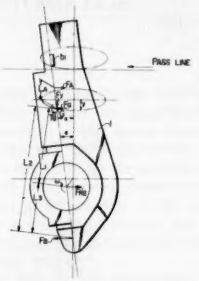
a bar extending across said feed table near said cutting area, said bar being positioned substantially parallel with the axis of said rotary cutting portion of said cutting element and said bar also being positioned above said feed table at a predetermined fixed distance therefrom so that paper to be cut must pass thereunder to thereby establish the maximum thickness of paper that can be cut by said cutting element.

3,868,879

OSCILLATING FLYING SHEAR

Yoshio Takakura; Yukio Otake, and Yukiyoshi Imai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 3, 1972, Ser. No. 303,471
Int. Cl. B23d *25/06*
U.S. Cl. 83—316 **8 Claims**



1. An oscillating flying shear comprising a shearing frame making an oscillatory motion in synchronism with the speed of a material being fed to be cut, a pair of cutters operated to be engaged with and disengaged from each other within said shearing frame, a mechanism for operating said shearing frame and said cutters, and means for applying to said shearing frame a righting force means for connecting said righting force means with said shearing frame, said connecting means being provided on said shearing frame at a predetermined distance from the center of gravity thereof toward said cutters, said predetermined distance being substantially equal to the distance computed in accordance with the equation:

$$L_A = (I\epsilon_o/Mx_o),$$

where:

L_A = said predetermined distance,

I = moment of inertia,

ϵ_o = maximum angle of inclination of said shearing frame,

M = mass of said shearing frame,

x_o = maximum amplitude of the shearing frame in the horizontal direction,

said righting force having a size proportional to the stroke of the shearing frame and is constantly directed toward the center of said stroke.

3,868,880

MUSICAL INSTRUMENT CONSTRUCTION

Emmett H. Chapman, 8320 Yucca Trl., Los Angeles, Calif. 90046

Division of Ser. No. 334,859, Feb. 22, 1973,. This application Apr. 3, 1974, Ser. No. 457,396
Int. Cl. G10d *1/08*
U.S. Cl. 84—267 **5 Claims**

1. In a musical instrument having an elongated fretted fingerboard and a plurality of tensioned strings extending longitudinally of the fingerboard immediately thereabove, the tuning of said strings as follows:

a melody set of at least four strings tuned at intervals of perfect fourths,

and a bass and chord set of at least three strings including a bass string, tuned at ascending intervals of perfect fifths above the pitch of the bass string,

the second string of the bass and chord set above the bass string being tuned one octave below the pitch of that of

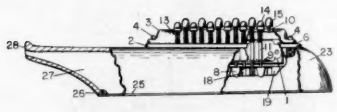
the third string of the melody set above the lowest pitched string of the melody set.

3,868,881

FINGERED HARMONICAS

Oran M. Heath, 1410 Crescent Drive, Corpus Christi, Tex. 78412

Filed Nov. 26, 1973, Ser. No. 419,126
Int. Cl. G10d *7/12*
U.S. Cl. 84—377 **3 Claims**



1. An air control system for a harmonica comprising a casing enclosing an air chamber; a harmonica-accommodating recess formed in said casing; a ventilated recess cover; valves positioned to open and close the multiple mouthpiece holes of a recessed harmonica; valve control means for opening said valves comprising a plurality of rods slidably extending through holes formed in said casing; a plurality of coiled springs surroundings a portion of said rods and normally biasing said valves in a closed position, said valves being affixed at the ends of said rods within said air chamber and finger pads affixed on the opposite ends of said rods located outside of said casing; and valve guide means for maintaining the valves in correct alignment with the mouthpiece holes of a recessed harmonica comprising a notched bar secured in said air chamber adjacent said valves.

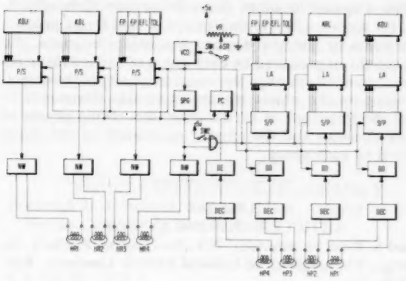
3,868,882

AUTOMATIC MUSICAL PERFORMANCE METHOD AND APPARATUS FOR A KEYED INSTRUMENT

Tutomu Fukui, and Tsutomu Suzuqui, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 19, 1973, Ser. No. 417,331
Claims priority, application Japan, Nov. 17, 1972, 47-115439
Int. Cl. G10g *3/04*
U.S. Cl. 84—462 **9 Claims**

1. A reproducing apparatus for use in an automatic musical performance apparatus for a keyed instrument, said reproducing apparatus accepting a prerecorded tape having recorded thereon a serial pulse line signal changing with time representing the operation of the keys of the keyed instrument and a synchronizing signal, said reproducing apparatus comprising:
a. reproducing means for reproducing the previously recorded synchronizing signal and the previously recorded serial pulse line signal representative of the key operation for producing the musical composition;
b. phase-locked loop means receiving said reproduced synchronizing signal for generating a clock pulse in accordance with the synchronizing signal;



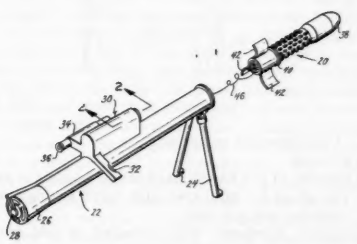
c. serial-to-parallel converting circuit means coupled to receive said clock pulse for converting the serial pulse line signal into a parallel signal group;
d. latching circuit means coupled to said converting circuit means for storing the value of a signal group until the occurrence of the next synchronizing signal; and
e. means coupling said latching circuit means to the music producing elements of said instrument.

3,868,883

GUIDANCE SYSTEM

James M. Tucker, Kirkwood, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 20, 1964, Ser. No. 346,165
Int. Cl. F42b *15/04*
U.S. Cl. 89—1.8 **16 Claims**



1. Means for guiding an object along a line-of-sight path from a launching site to a target comprising an object having an aerodynamically stable shape with a front to rear axis oriented during flight to extend substantially on the line-of-sight between the launching site and the target, means at the launching site for launching the object on a course toward the target, means for causing the object to roll about its axis at a predetermined roll rate, a light source mounted on the object in position to project light rearwardly therefrom, means at the launching site for aiming and sighting on the target, other means at the launching site oriented with the aiming and sighting means for tracking the object during flight, said tracking means including light sensitive means and means for focusing light from the light source on the object into a spot on the light sensitive means, the position of said spot on the light sensitive means corresponding to the position of the object relative to the line-of-sight between launching means and the target as determined by the aiming and sighting means, means

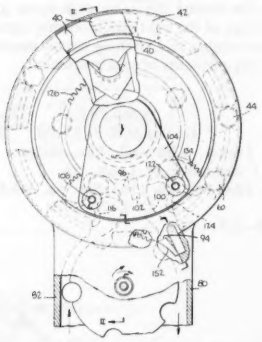
responsive to the vertical position and to changes in the vertical position of the light spot on the light sensitive means for producing first control signals, means responsive to the horizontal position of the light spot and to changes thereof for producing second control signals, means for sending commands corresponding to said first and second signals to the object, a plurality of one-shot thrust producing elements mounted at spaced locations about the surface of the object, means for sequentially exciting groups of said thrust producing elements to laterally displace the object in space, the combined thrust produced by each group of excited elements acting substantially through the center of gravity of the object, and means on the object responsive to said commands to control the frequency of excitation of succeeding groups of thruster elements and the angular orientation of the thrust produced by each group.

3,868,884

ARTICLE HANDLING SYSTEM

Richard S. Rose, Schenectady, N.Y., and Burton P. Clark, St. George, Vt., assignors to General Electric Company, Burlington, Vt.

Filed July 9, 1973, Ser. No. 377,396
Int. Cl. F41f *9/00*
U.S. Cl. 89—11 **6 Claims**



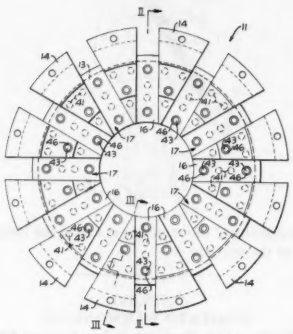
1. A machine gun comprising:
a housing;
a plurality of gun barrels fixed to said housing in an annular row about a central axis, each barrel having a respective chamber and gun bolt;
a rounds distributor ring journalled to said housing for rotation about said central axis,
said ring having
a first plurality of first pockets disposed in an annular row about said central axis, and
a second plurality of second pockets disposed in an annular row about said central axis;
a feeder sprocket journalled to said housing for rotation about an additional axis for receiving rounds and for discharging fired cases;
guide means journalled to said housing for oscillation between a first position whereat it guides a round from said feeder sprocket into one of said first pockets, and a second position whereat it guides a fired case from one of said second pockets into said feeder sprocket; and
transfer means journalled to said housing for rotation about said central axis and having
first means for transferring rounds from said first plurality of pockets to said gun bolts, and
second means for transferring fired cases from said gun bolts to said second plurality of pockets.

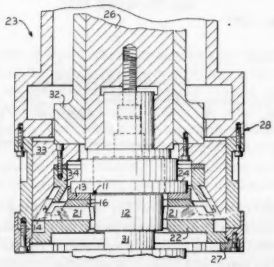
3,868,885

CUTTER HEAD AND METHOD OF FORMING SAME

Joseph D. Menne, Canton, and George N. Sigulas, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 317,162, Dec. 17, 1973, Pat. No. 3,820,227. This application Feb. 1, 1974, Ser. No. 438,538
Int. Cl. B23f *21/12*
U.S. Cl. 90—11 A **2 Claims**





1. A cutter head for a cutting machine of the type wherein cutting tools are radially arranged in circumferentially spaced relation on the head, comprising an annular pressure plate, a plurality of uniformly dimensioned, wedge-shaped tool slot separators and a plurality of uniformly dimensioned, generally rectangular tool slot spacers, the separators and spacers being alternately arranged in circumferential and abutting relation on the annular pressure plate, the separators having a greater thickness than the spacers to form a plurality of slots for receiving the plurality of cutting tools, the uniformly dimensioned separators and the uniformly dimensioned spacers being selectively heat treated prior to mounting on the pressure plate in order to minimize stress concentrations.

3,868,886

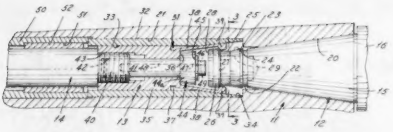
TOOL HOLDING ASSEMBLY

Dale J. Bondie, Fowlerville, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.

Filed July 5, 1973, Ser. No. 376,634
Int. Cl. B23c *5/26*
U.S. Cl. 90—11 D **4 Claims**

1. In a tool holder and tool holder seat assembly of the type wherein the tool holder seat is non-rotatably fixed to the rotary spindle of a machine tool and the tool holder is held in frictional non-rotatable engagement with the tool holder by a draw bar; said tool holder seat comprising a frusto-conical socket; said tool holder comprising a frusto-conical shank complemental to said socket and a draw bar connector por-

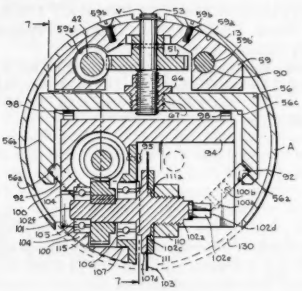
tion projecting from the small diameter end of said shank, said draw bar connector portion having an enlarged end portion spaced from the small diameter end of said shank and defining a shoulder adapted to be engaged by expandable and contractible gripping means, a flared ramp portion on said draw connector portion spaced axially from said enlarged end portion toward the small diameter end of said shank, said ramp portion tapering radially and axially outwardly in the direction of the large end of said shank for causing expansion of such expandable and contractible gripping means when engaged thereby to release the tool holder therefrom.



3,868,887
CALIBRATED SLOT CUTTER

Alvin A. Sorenson, 5811 Flamingo, Houston, Tex. 77033

Filed Jan. 18, 1973, Ser. No. 324,676
Int. Cl. B23c *3/30*
U.S. Cl. 90—12 B **4 Claims**



1. A cutter device for cutting a calibrated notch or groove in a substantially cylindrical workpiece member comprising:

a. a longitudinal extending tubular housing adapted to be inserted into the workpiece member, said tubular housing including a motor drive unit at one end thereof and a cutter assembly unit at the other end thereof, said tubular housing substantially enclosing said cutter assembly unit;

b. motor means mounted adjacent said motor drive unit, said motor means being mounted externally of said tubular housing;

c. said cutter assembly unit comprising:

1. axially spaced holding block means attached to said tubular housing;

2. carriage support means supported by said holding block means and relatively movable thereto transversely of said tubular housing;

3. a cutter carriage supported by said carriage support means and relatively movably thereto longitudinally of said tubular housing;

4. cutter drive means in said cutter carriage;

5. cutter means carried by said cutter drive means;

d. means for moving said carriage support means with respect to said holding block means transversely of said tubular housing;

e. means in said motor drive unit for actuating said means for moving said carriage support means transversely of said tubular housing;

f. means for moving said cutter carriage with respect to said carriage support means longitudinally of said tubular housing;

g. means in said motor drive unit for actuating said means for moving said cutter carriage longitudinally of said tubular housing;

h. a first drive shaft rotatably mounted in said motor drive unit operably connected to said motor means;

i. a second drive shaft rotatably mounted in said cutter assembly unit and operably connected to said cutter drive means;

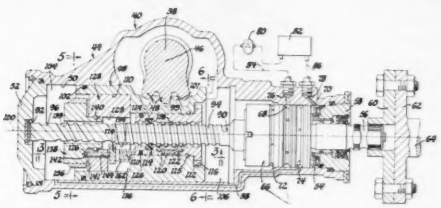
j. means for releasably connecting said first and second drive shafts together for driving said cutter drive means with said motor means; and,

k. means for expansively locking said tubular housing in the cylindrical workpiece.

3,868,888
VEHICLE STEERING GEAR ASSEMBLY

Frederick L. J. Rehfeld, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1973, Ser. No. 419,638
Int. Cl. B62d *5/06, 3/08*
U.S. Cl. 91—375 A **8 Claims**



1. In a vehicle steering gear of the type including a housing, an input shaft disposed on said housing for rotation about a first axis of the latter, a pitman shaft disposed on said housing for rotation about a second axis of the latter, a sector gear rigidly disposed on said pitman shaft and defining a plurality of teeth, and a rack member disposed on said housing for bodily shiftable movement along said first axis and defining a plurality of rack teeth engageable on said sector teeth for effecting rotation of said pitman shaft in response to bodily shiftable movement of said rack member, the combination comprising, a worm shaft disposed on said housing for rotation as a unit with said input shaft about said first axis, means on said worm shaft defining a first thread of predetermined lead, means on said worm shaft defining a second thread of predetermined lead less than said first thread lead, a first follower threadedly engaging said first thread, a second follower threadedly engaging said second thread, clutch means disposed on said rack member between said first and said second followers and actuateable between a first range condition connecting said first follower and said rack member and a second range condition connecting said second follower and said rack member, and control means associated with said clutch means responsive to the magnitude of torque experienced by said input shaft for actuating said clutch means between said first range and said second range conditions when said input shaft torque exceeds a predetermined minimum magnitude.

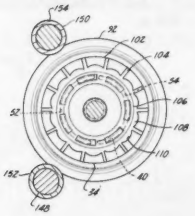
3,868,889
FLUID DEVICE HAVING MEANS FOR ALIGNING A CYLINDER BARREL

Wilfred S. Bobier, Bloomfield Hills, Mich., assignor to The Oilgear Company, Milwaukee, Wis.

Division of Ser. No. 60,333, Aug. 3, 1970, Pat. No. 3,739,691.
This application Nov. 27, 1972, Ser. No. 309,649
Int. Cl. F01b *13/04*; **F04b** *49/00*
U.S. Cl. 91—506 **6 Claims**

1. A fluid pressure energy translating device of the axial piston type, comprising: a housing; a cylinder barrel rotatably

mounted within said housing, said cylinder barrel having a plurality of arcuately spaced cylinder bores and cylinder ports communicating each of said cylinder bores with one end of said cylinder barrel; a plurality of pistons with inner ends disposed for reciprocal stroking movement within said cylinder bores; a valve face having arcuate passages; said valve face and said one end of said cylinder barrel being disposed for relative rotary movement with said cylinder ports communicating successively with said arcuate passages in said valve face; thrust plate means comprising a yoke support fixedly mounted in said housing and a yoke movably supported by said yoke support, said yoke being in a driving relationship with the other ends of said pistons for imparting said reciprocal stroking movement to said pistons within said cylinder barrel bores as said cylinder barrel rotates; bearing means having an outer race carried within said housing, an inner race carried around a portion of the peripheral surfaces of said cylinder barrel, said bearing means providing radial support for said cylinder barrel, said bearing means being in contact



with said yoke support at a plurality of circumferentially spaced locations for properly locating said cylinder barrel with respect to said yoke; said outer race being carried by said housing concentric with said housing bore; said means for varying the inclination of said yoke comprising a pair of sleeve members each disposed along an axis paralleling the axis of said shaft and radially outwardly spaced from the peripheral surface of said cylinder barrel, each of said sleeve members having one end of a piston member reciprocably mounted therein, the other ends of said piston members adapted to abut a portion of said yoke to pivot said yoke, said sleeve members being radially spaced a distance from the centerline of said shaft axis to abut the outer race of said bearing means at locations which are between said cylinder barrel and said sleeve members to maintain said bearing races in abutment with said yoke support, said piston members carried within said sleeves being so spaced from said longitudinal axis of said shaft to freely reciprocate in a spaced relationship from the outer periphery of said outer race.

3,868,890

SEAL FOR HYDRAULIC PRESSURE MODULATOR

James K. Roberts, and Edward M. Pauwels, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

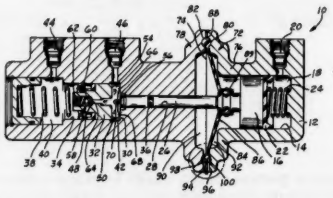
Filed Oct. 1, 1973, Ser. No. 402,545
Int. Cl. F01b *31/00*
U.S. Cl. 92—86 **12 Claims**

1. In a hydraulic device:

a housing defining a bore therewithin,

a diaphragm secured to said housing and including a web extending transversely across said bore to divide the latter into a pair of compartments;

said housing defining a passage communicating said bore with the exterior of said housing, said diaphragm extending into said passage, said web dividing said passage into a first section for communicating one of said compartments with the exterior of the housing and a second section for communicating the other compartment with the exterior of the housing, and a pair of movable lips extending from opposite sides of said diaphragm for engagement with opposite walls of said passage and when in



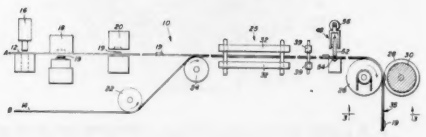
disengagement with said passage, permitting said communication between the respective compartments and the exterior of the housing.

3,868,891

MACHINES AND METHODS FOR THE MANUFACTURE OF CONTAINERS AND THE PRODUCT THEREFROM

Frank T. Parish, Frederick, Md., assignor to Pressure Chemical Corporation, Charleston, W. Va.

Continuation-in-part of Ser. No. 78,023, Oct. 5, 1970, abandoned. This application May 25, 1971, Ser. No. 146,684
Int. Cl. B31b *1/14, 1/84*
U.S. Cl. 93—8 W **8 Claims**



1. Apparatus for the mass manufacture of bags from first and second continuous lengths of plastic strips having grommets at predetermined bag-length intervals in said first sheet, comprising in combination:

a. first and second sources from which said strips extend to an end position,

b. drive means at said end position for pulling strips from said sources at regular time intervals of sufficient duration to move said strips one of said bag lengths,

c. guide means directing said first and second strips from their respective sources to a mating planar relationship with one another with their respective side edges in the same plane normal to the direction of strip movement,

d. first sealing means between said guide means and said drive means sealing said edges together at bag-length intervals,

e. second sealing means imparting end seals transversely of said strips between said edges at bag length intervals,

f. perforating means weakening said strips through said end seals an amount sufficient to permit separation of one bag from its adjacent bags by relatively light tearing force but insufficient to cause bag separation because of the pulling forces of said drive means, and

g. wherein said perforating means of paragraph (f) is a spiked wheel that moves transverse to said strip.

3,868,892

APPARATUS FOR MANUFACTURING BAGS WITH AN INNER BAG WHICH HAS A Z-FOLD

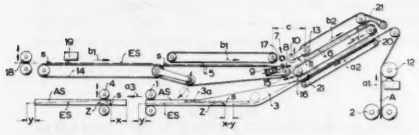
Aloys Winnemoller, Rhine, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Sept. 6, 1973, Ser. No. 394,818

Claims priority, application Germany, Sept. 12, 1972, 2244697

Int. Cl. B31b *39/26*

U.S. Cl. 93—8 W **12 Claims**



1. An apparatus for manufacturing a carrying bag including an outer bag and an inner bag having a Z-fold formed therein comprising means for conveying a web having at least one layer for forming said outer bag in a first direction at a first speed, means for conveying a tubular material having transverse weld seams for forming the base of said inner bag, said tubular material conveying means including a first double-belt conveyor for conveying said tubular material in a substantially horizontal second direction at a higher speed than said first speed at which said web is conveyed, belt guide means positioned at the discharge end of said first double-belt conveyor and being movable forward and backward with respect to said second direction in which said tubular material is conveyed, a second double-belt conveyor positioned downstream from said first double-belt conveyor for conveying said tubular material at said first speed at which said web is conveyed and for depositing said tubular material onto said web, said second double-belt conveyor being positioned to convey said tubular material first slightly upwardly with respect to said substantially horizontal second direction and to then reverse the direction of travel of said tubular material so that it is traveling slightly downward in the opposite direction and in substantially the same direction as said first direction in which said web is conveyed, said belt guide means including first spaced apart belt guide rollers, spaced apart conveyor belts mounted on said first belt guide rollers, folding fingers mounted to be moveable forward and backward with respect to said first belt guide rollers, said folding fingers being mounted to be moved through the spaces between said conveyor belts and first belt guide rollers and to extend as far as the inlet end of said second double-belt conveyor, second belt guide rollers positioned at the inlet end of said second conveyor, spaced apart individual rollers mounted so as to be moveable forward and backward to cooperate with said second belt guide rollers, said individual rollers and the spaces between said rollers, respectively, being substantially in alignment with said first belt guide rollers and the spaces therebetween, means for shaping said web into tubular shape to form said outer bag and to envelop said inner bag, and means for dividing the resulting carrying bag from said web.

3,868,893

APPARATUS FOR PRODUCING COMPOSITE CONTAINERS

Brian Leo Chudleigh Sutch, Thames Ditton, England, assignor to Airfix Industries Limited, London, England

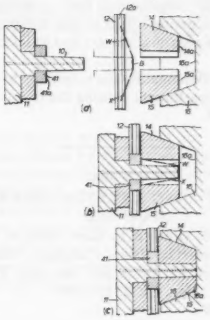
Filed Oct. 10, 1973, Ser. No. 405,103

Claims priority, application Great Britain, Oct. 10, 1972, 46582/72; Mar. 22, 1973, 14015/73

Int. Cl. B31b *1/44, 1/62*

U.S. Cl. 93—50 **10 Claims**

1. Apparatus for producing a composite container from a blank comprising an end wall panel and side wall panels each of which projects from the end wall panel, the apparatus comprising a cavity tool having a cavity therein including side walls, a core tool movable relative to the cavity tool between an open and a closed condition, the cavity tool comprising cavity tool parts themselves slidably movable along said side walls between an open condition and a closed condition in the latter of which and with the core tool and the cavity tool in the closed condition a cavity is defined which corresponds to the shape of the container to be produced, a blank guide for receiving a blank and positioning the blank in the open condition of the core tool and the cavity tool between those tools



and spaced therefrom and with the end wall panel in the path of relative movement of the core tool, relative movement of the core tool and the cavity tool in the closing direction, with a blank positioned by the guide therebetween, being operative to drive the end wall panel of the blank relative to the side wall panels and to the guide toward the cavity tool and to cause the core tool to move the cavity tool parts towards their closed condition, means being provided to inject material into vacant parts of the cavity defined by the core tool and the cavity tool in the closed condition to seam edges of the blank juxtaposed by relative movement of the core tool and cavity tool during relative closing movement.

3,868,894

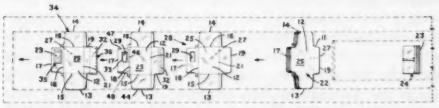
METHOD FOR MAKING TWO COMPARTMENT ENVELOPES

Charles S. Watson, Glen Ridge, N.J., assignor to Berlin & Jones Company, Inc., East Rutherford, N.J.

Filed Dec. 14, 1973, Ser. No. 424,876

Int. Cl. B31b *49/04, 1/82*

U.S. Cl. 93—61 A **4 Claims**



1. A method for making a two compartment envelope from a unitary sheet of paper having an inward side and an outward side and having a rectangular back, a first and a second side flap each hinged on opposite edges of and foldable against the inward side of the back panel and overlappable to form a first compartment, a front flap of less width than the back panel and hinged on a remaining edge of the back panel and foldable against the side flaps to form a second compartment, a forth edge hinged to a closure flap which folds over into contact

with the front panel to enclose both the first and the second compartments, the method comprising steps of:

advancing the sheet open with the inward side upward along a continuous path,

printing with ink on the outward side of the sheet,

die cutting a window in the front flap,

applying pressure sensitive adhesive to the closure flap and to a margin of the front flap about the window,

applying a strip of a release paper over the adhesive on the closure flap,

applying a patch of a transparent film over the window and in contact with the adhesive on the front flap,

drying the ink,

applying gum to a remote margin of one of the side flaps,

folding the side flaps against the inward side of the back panel with the ungummed flap overlapped by the gummed flap to define a first of the compartments,

applying gum to a proximal margin and to lateral margins of the front flap,

folding the front flap against the side flaps to define a second of the compartments, folding the closure flap against the front panel.

3,868,895

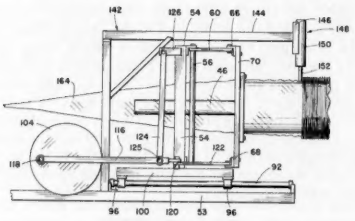
DEVICE FOR LOADING A PLASTIC SLEEVE ONTO A MANDREL

Robert J. Hart, and Milburn L. Hart, both of Tulsa, Okla., assignors to Commercial Resins Company, Tulsa, Okla.

Filed Oct. 12, 1973, Ser. No. 405,771

Int. Cl. B31f *1/08*

U.S. Cl. 93—84 TW **9 Claims**



1. A device for loading a sleeve of plastic film onto a mandrel and comprising carriage means for supporting the mandrel in a substantially horizontal position, a loading assembly disposed in substantial alignment with the carriage means for movably receiving the mandrel and plastic film sleeve therein, reciprocating means for moving the loading assembly relatively towards and away from said carriage means, film engaging means carried by the loading assembly for loading the film onto the mandrel, connecting means provided on the loading assembly and operably connected with the film engaging means for moving the film engaging means inwardly into engagement with the film as said loading assembly is moved relatively towards said carriage means for loading of the film onto the mandrel in an accordian type operation, said connecting means moving said film engaging means outwardly away from said film as said loading assembly is moved relatively away from said carriage, whereby a relatively great length of film sleeve may be loaded onto a relatively short mandrel, and blower means provided on the carriage means for moving a column of air through the mandrel and into the plastic sleeve being loaded thereon for facilitating the loading operation.

3,868,896

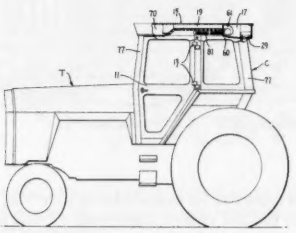
VEHICLE CAB ENCLOSURE WITH VENTILATION MEANS

Robert M. Doll, Farmington; Joseph L. Jessup, Detroit, and Lawrence J. Stone, Livonia, all of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Mar. 28, 1973, Ser. No. 345,807

Int. Cl. B60h *1/24*

U.S. Cl. 98—2.11 **7 Claims**



1. In a vehicle cab enclosure including a forced air ventilation system, a forced air means for drawing air from outside the cab, means for distributing air from the forced air means in the cab, an air intake opening connected to the forced air means and providing for air entering or leaving the cab, filter and screen in said air intake opening, a cab door swingable between an open position and a closed position, and characterized by said filter having a lower outwardly exposed surface facing downward and facing said opening so that air passing from outside the cab to said forced air means moves upward through the filter, said air intake opening constituting the major path for air leaving the cab when the door is closed so that as the door is rapidly swung from its open to its closed position there is sudden flow of air in a reverse direction through said forced air means and said filter and screen, whereby foreign particles collected on the lower outwardly exposed surface of the filter are loosened and fall away by gravitational force.

3,868,897

MACHINE FOR CONTINUOUS TREATMENT BY MEANS OF LIQUIDS, MORE PARTICULARLY FOR PASTEURISATION OF SUBSTANCES IN SACHETS

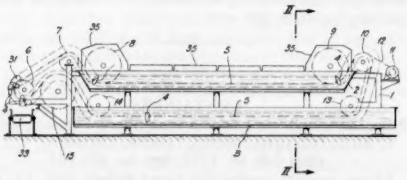
Claude Moreau, Nantes, France, assignor to Societe Financiere Et Industrielle Des Ateliers Et Chantiers De Bretagne, Loire Atlantique, France

Filed June 26, 1972, Ser. No. 266,399

Claims priority, application France, Apr. 17, 1972, 72.13392

Int. Cl. A23l *3/08*

U.S. Cl. 99—483 **7 Claims**



1. In a machine for continuously subjecting products to liquid treatment and comprising an endless conveyor having gear wheels at its ends which carries the products from a loading station to an unloading station as it passes through one or more treatment stations, the improvement comprising

providing said conveyor with open work baskets to receive the products, said open work baskets being provided with a hinged cover urged into closure position and wherein cam devices are provided at the loading station and the unloading station for opening said cover as the basket passes the station, said loading and unloading stations being grouped at one end of the conveyor, said cam devices being common to these two stations, and wherein covers of said baskets have projections which cooperate with lateral cams disposed coaxially of the gearwheels of the corresponding end of the conveyor, the bottom run of the conveyor arriving obliquely downwards in the direction of said gearwheels and leaving the same obliquely upwards, the cams extending over substantially 180° from points situated slightly downstream of the lowest point of the conveyor.

3,868,898

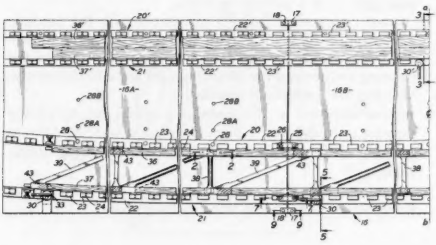
ROLLING TRUSS JOINT CONNECTOR PLATES

Arthur Carol Sanford, 2308 Bay Drive, Hillsboro Shore, Pompano Beach, Fla. 33062

Continuation-in-part of Ser. No. 332,347, Feb. 14, 1973, abandoned. This application July 30, 1973, Ser. No. 382,321

Int. Cl. B30b *13/00*

U.S. Cl. 100—35 **19 Claims**



1. The method of fully embedding toothed connector plates in opposite faces of assembled truss components including wood components, comprising clamping the truss components in horizontal assembled position on a vertically flexible horizontal jig bed with the toothed plates located on the top and bottom faces of said wood components, positioning a pair of vertically spaced pressure rolls above and below said jig bed having the nip of the rolls positioned relative to the plane of the jig bed to conform the bed progressively during passage between the rolls to the curved area at the nip of the lower roll, and causing relative movement between the jig bed and the rolls, thereby embedding the top and bottom toothed plates into the wood components.

3,868,899

BALLOON PRINTING APPARATUS

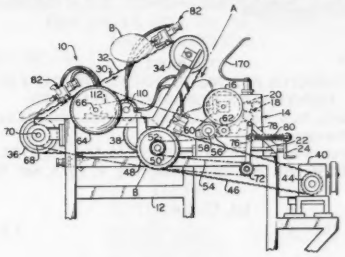
Norman H. Nye, 1348 Highbridge Rd., Cuyahoga Falls, Ohio 44222, and Arthur T. Medkeff, 260 Fawnwood Dr., Tallmadge, Ohio 44278

Filed Apr. 30, 1973, Ser. No. 355,464

Int. Cl. B41f *17/00*

U.S. Cl. 101—35 **2 Claims**

1. Apparatus for printing on balloons and including in combination a printing press comprising a rotary printing cylinder for carrying an inked printing plate and apparatus for moving inflated balloons through a path tangent to said printing cylinder and characterized by an endless conveyor movable through a fixed course including a straight portion adjacent a position of the periphery of said cylinder and which straight portion would be tangent to said portion of the periphery of said cylinder but is spaced therefrom, drive means for said cylinder and said conveyor to drive them at correlated speeds, a balloon positioning means on said conveyor having a balloon engaging tube extending in the direction of movement of said conveyor, a fixed source of a compressed gas, rotary seal joint means connected to said gas source, and flexible tube means connecting said rotary seal joint means to said balloon engaging tube to connect to the interior of a balloon positioned on said engaging tube to connect the balloon to said gas source or to atmosphere to control the pressure in the balloon and inflate it prior to movement past said cylinder, the balloon



being pressed against said cylinder for receiving a printed impression therefrom by said straight portion of said conveyor, said balloon engaging tube positioning any said balloon to extend directly rearwardly therefrom in relation to the direction of movement of said conveyor, to pull a balloon past said printing cylinder while held thereagainst by said straight portion of the fixed course of said conveyor, the conveyor and the periphery of said printing cylinder being adapted to be moved at substantially equal speeds.

3,868,900

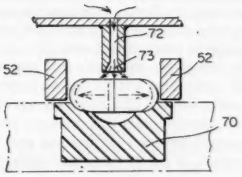
CAPSULE PRECISION PRINTING APPARATUS AND METHOD

Edward M. Ackley, Stone Harbor, N.J., assignor to R. W. Hartnett Company, Philadelphia, Pa.

Filed Sept. 4, 1973, Ser. No. 393,964

Int. Cl. B41f *17/36;* **B65g** *47/24*

U.S. Cl. 101—40 **15 Claims**



1. In an apparatus for processing a capsule having interfitted longitudinally relatively slidable body and cap members having a juncture therebetween, means for lengthening said capsule to a precision length while said cap and body members remain interfitted, said precision length being less than the total length of said cap plus the length of said body, comprising:

a. supporting means for carrying the capsule while said capsule has a length less than said precision length, with the longitudinal axis of said capsule arranged in a predetermined direction;

b. means for moving said supporting means and capsule along a predetermined path which is generally transverse to said predetermined direction while said capsule has less than said precision length;

c. a pair of stop members located at opposed sides along said path and spaced apart from one another at a predetermined distance corresponding to said precision length, and

d. positive pressure fluid jet means spaced from and located generally intermediate said stop members and aimed substantially at said juncture when said capsule is located between said stop members, thereby sliding the cap and body relative to each other to move the ends of said cap and body away from each other until they contact the respective stop members, whereby said capsule is expanded to said precision length while said cap and body remain interfitted.

3,868,901

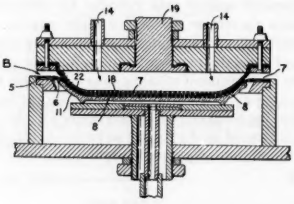
APPARATUS FOR MECHANICAL CONTACT IN PRINTING ON CERAMIC TABLEWARE

Jose Valiela, New York, N.Y., assignor to Interspace Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 255,738, May 22, 1972, Pat. No. 3,756,165. This application Aug. 9, 1973, Ser. No. 387,111

Int. Cl. B41f *17/00*

U.S. Cl. 101—41 **7 Claims**



1. In an apparatus for applying a decorative colorant to an item of ceramic tableware; wherein the apparatus comprises in combination: a rigid planar ring defining a central opening, an elastic open mesh net secured to the ring and covering the opening, the net provided with a solid area having a total release transfer surface thereon within the area of the opening, the colorant printed on at least one area of the transfer surface, the net being resiliently displaceable out of the plane of the ring whereby to permit the colorant on the transfer surface to be engaged into contact with the tableware so that it is printed thereon, a gas inflatable and vacuum deflatable balloon operable against the net for biasing same in a direction to move the transfer surface into a quickly out of contact with the tableware; an improvement comprising a permeable flexible fabric interposed between the balloon and the solid area to obviate formation of gas pockets therebetween.

3,868,902

MULTI-STATION PRINTING MACHINE FOR CERAMIC WARE

Arthur Bradshaw, Audlem, and Frank William Meadows, Stoke-on-Trent, both of England, assignors to Service (Engineers) Limited, Staffordshire, England

Filed July 26, 1973, Ser. No. 382,698

Claims priority, application Great Britain, July 29, 1972, 35547/72

Int. Cl. B31f *17/00*

U.S. Cl. 101—44 **1 Claim**

1. A multi-color printing machine for use with ceramic ware comprising:

A. a frame for supporting the machine;

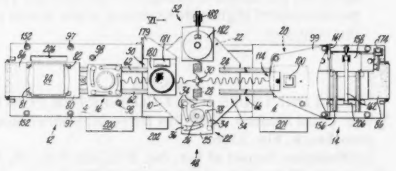
B. a turntable rotatably mounted on the frame;

C. a plurality of paired parallel tracks mounted on the turntable and extending radially on the turntable toward the outer periphery thereof;

D. ceramic ware support plates mounted for sliding movement on the paired tracks, said plates having suction means to receive and hold the ceramic ware;

E. means to rotate and stop the turntable at a plurality of transfer positions;

F. a plurality of printing stations mounted on the supporting frame at positions about the periphery of the turntable corresponding to the transfer positions, said printing stations having a printing pad at each printing station arranged to pick up a design in colored ink from an intaglio plate and to print the design onto the piece of ceramic ware, means for depositing ink onto the intaglio plate, and independently operated doctoring means for wiping the ink into the design on the intaglio plate;



G. paired tracks mounted on the frame at the printing station for alignment with the tracks on the turntable when said table is in a transfer position;

H. transfer means operatively associated with the ceramic ware support plate for moving said plate along the turntable tracks, onto the printing station tracks, and to the printing station and for returning said plate to the turntable after the printing is applied;

I. means mounted at the transfer position for sprinkling powder onto the newly printed ceramic ware to prevent marring of the design during subsequent printing operations; and

J. means for removing excess powder from the ceramic ware before subsequent printing operations.

3,868,903

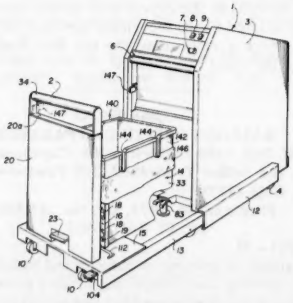
PORTABLE COMPACTING APPARATUS

Anthony P. Montalbano, Freshmeadows, N.Y., assignor to Environmental Pollution Research Corporation, New Hyde Park, N.Y.

Filed Mar. 2, 1973, Ser. No. 337,567

Int. Cl. B30b *1/18, 15/14*

U.S. Cl. 100—45 **76 Claims**



1. A portable compacting apparatus comprising:

a portable, rollable power unit; and

a portable, rollable container unit adapted to be removably received in said power unit;

said power unit comprising:

means for receiving said container unit in said power unit;

a ram unit operable to compact material in said con-

tainer unit when said container unit is received in said power unit; and said container unit comprising:

means for guiding said container unit into said power unit; and

a container for receiving material to be compacted, said container being in registration with said ram when said container unit is received in said power unit for compaction of said material; and

at least one of said power unit and container unit including at least one resilient rotatable member having a nonyieldably mounted axle mounted thereon, said at least one resilient rotatable member being engagable with the other of said power and container units for facilitating reception of said container unit in said power unit, said resilient rotatable member yielding upon compacting of material in said container unit.

3,868,904

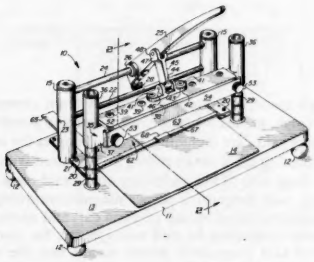
BED AND PLATEN PRINTER

Kurt J. Wulf, 3624 E. Montecito, Phoenix, Ariz. 85018

Filed Mar. 21, 1973, Ser. No. 343,216

Int. Cl. B41f *1/02, 1/06*

U.S. Cl. 101—316 **1 Claim**



1. A miniature printer comprising:

a frame,

a horizontal positioned bolster plate fixed to said frame,

a pair of parallelly arranged spaced guide pins mounted on said plate in perpendicular arrangement thereto,

a platen mounted on said pins and arranged to extend therebetween for sliding movement therealong at right angles to said plate,

an actuating device on said frame operable for moving said platen during a printing operation into contact with said plate,

said actuating device comprising a lever pivotally mounted on said frame on a first shaft mounted on said plate parallel with said platen at a position spaced from said platen and said plate, and a link pivotally connected at one end to said lever and at the other end to said platen,

said actuating device when moving said platen toward said plate first moving said link at an obtuse angle with the direction of movement of said platen and then sequentially transcending into movement axially with the direction of movement of said platen,

latch means mounted on one end of said lever and actuated by movement of said actuating device for engaging a second shaft mounted on said plate spaced from said first shaft between said plate and said first shaft and in perpendicular arrangement to said plate,

said latch means comprising a flat spring curved at one end for engaging at the outer periphery of said curved end said second shaft for holding said lever in a given position on said frame until said actuating device is again actuated toward said plate,

means mounted on said plate for firmly positioning an item to be impressed below said platen, and

a composing stick holding type settings detachably mounted on said platen for engaging the item mounted on said plate upon movement of said platen toward said plate.

3,868,905

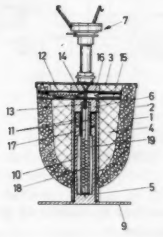
SPRINGMINE

Franz Ragailler, Eferding, Austria, assignor to Armaturen-Gesellschaft m.b.H., Schwanenstadt-Rustdorf, Austria

Filed Jan. 10, 1973, Ser. No. 322,490

Int. Cl. F42b *23/16*

U.S. Cl. 102—8 **2 Claims**



1. A spring mine including a mine body disintegratable into fragments under the action of a detonating bursting charge, a lower part of the mine body being formed arched downwardly so as to be substantially hemispherical and an upper part joined to the hemispherical lower part being formed generally cylindrical, said mine body consisting of metal particles embedded in a plastics material, a central, vertical bore in said mine body and being open in the region of the arched lower part, a guide plunger which is fixed to a base plate being received in said vertical bore, an ejector charge being disposed in the bore above the guide plunger, a drawing means is provided for detonating the bursting charge, said drawing means extending along the vertical central axis of said mine body, one end of said drawing means being anchored in the center of the base plate and the other end being connected to a securing element of a detonator for the bursting charge.

3,868,906

CONTROL AND HANDLING OF GARMENT HANGERS

Anson W. Cameron, 300 N. State St., Apt. 5818, Chicago, Ill. 60610

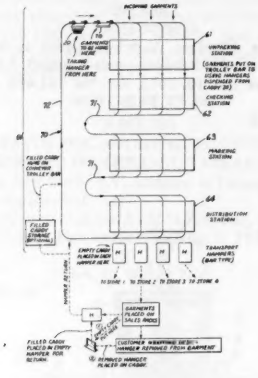
Filed Aug. 24, 1973, Ser. No. 391,217

Int. Cl. B61b *3/00*

U.S. Cl. 104—89 **9 Claims**

1. A caddy for garment hangers comprising, in combination, a stiff tubular member, a relatively stiff retainer strip substantially coextensive with the tube, latching members secured to the ends of the retainer strip, the tube having receiving openings at its respective ends for insertion of the latching members, the latching members being dimensioned to extend through and beyond the tube, the latching members being slideable in the receiving openings for broadwise movement of the retainer strip from a clamping position in which the retainer strip clampingly engages the hooks of a plurality of hangers assembled on the tube and a parallel retracted position in which the retaining strip is spaced free of the hooks, each latch member being formed of a strip having a movable latch portion presenting a latching surface which engages the wall of the tube to hold the retainer strip in clamping position and which is releaseable from the wall of the tube by finger pressure to permit movement of the retainer strip to its parallel retracted position, and stop means on each of the latching

members arranged to engage the wall of the tube for preventing complete retraction of the latching members from the tube



so that the retaining member is captive at both ends on the tube in its retracted position.

3,868,907

HOOKING DEVICE FOR A SKI-LIFT TOW BAR AND SKI-LIFT INCLUDING SAID BARS

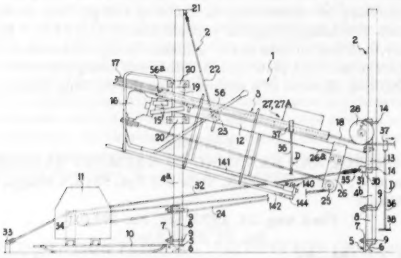
Jacob Kees Schippers, Le Touvet, France, assignor to Schippers Freres, Le Trouvet, France

Filed Sept. 5, 1973, Ser. No. 394,545

Claims priority, application France, Sept. 8, 1972, 72.32015; Sept. 8, 1972, 72.32016

Int. Cl. B61b *7/04, 7/20*

U.S. Cl. 104—173 **17 Claims**



1. A ski-lift comprising an endless traction cable, a cable-driving station and a cable-returning station respectively located at opposite ends of a slope having an upper end and a lower end, the stations comprising pulleys around which pulleys the cable extends, the pulley pertaining to the cable-driving station being a drive pulley, a plurality of hooking devices engaged on the cable, each hooking device comprising a rigid support defining a passage for receiving the cable, the passage having in cross section a median enlarged part and two opposed V-section recesses located on opposite sides of the median enlarged part which enlarged part is such that the cable is freely movable through the enlarged part, the V-section recesses being capable of wedging against the cable so as to render the support rigid with the cable, the support having means defining a lateral opening communicating with the passage for laterally introducing the cable into the passage, means defining an abutment surface on the support, the station at the lower end of the slope comprising a reception magazine for storing the hooking devices which are not used and having an exit, the magazine comprising a slideway cooperative with the abutment surfaces of the hooking devices and a mechanism which includes locking means and is adapted to release the hooking devices one by one in accordance with the demand and is located at an end of the slideway, the slideway being adjacent the path of the cable and extending in the same direction as the cable at such level with respect to the level of the cable whereby, when the abutment surfaces of each hooking device is engaged on the slideway, the support is raised to a position with respect to the cable in which the cable can freely pass through the median part of the passage of the hooking device.

3,868,908

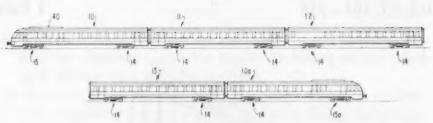
GAS TURBINE RAILWAY CAR

Andre E. Pelabon, 68 Avenue Henri Martin, Paris 16, France

Filed Apr. 13, 1973, Ser. No. 350,807

Int. Cl. B61c *5/00, 9/34;* **B61d** *1/00*

U.S. Cl. 105—1 R **10 Claims**



1. A high-speed, self-propelled railway train comprising a plurality of cars, means for supplying propulsive power for the train, each of said cars including a pair of bogies for independently supporting each car in rolling engagement with a track system, at least one of the endmost cars of said train being a traction car, said propulsive power means comprising prime mover means contained in said traction car, and on engineer's compartment contained in said traction car for controlling operation of said propulsion power means and the starting, running, and stopping of the train, said prime mover means comprising, a single gas turbine engine of the variable output speed free running turbine type, variable speed ratio hydraulic transmission means connected to the output of said turbine, and fixed ratio transfer gear means for transmitting power from the output of said hydraulic transmission to at least one pair of wheels of a bogie supporting, said traction car whereby said train can be propelled at varying speeds from a standing stop by said free running turbine.

3,868,909

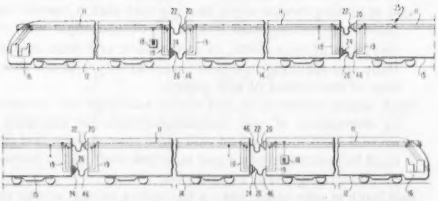
RAILWAY TRAIN CONTROL LINE ADAPTOR PLUG

Andre E. Pelabon, 68 Avenue Henri Martin, Paris 16, France

Filed Apr. 13, 1973, Ser. No. 350,809

Int. Cl. B61d *49/00;* **B61g** *5/06;* **H01r** *33/00*

U.S. Cl. 105—1 R **5 Claims**



1. In a railway train of the type normally having at least three cars coupled together, each of the endmost cars containing a train propulsion prime mover and an engineer's control station including indicators and control instruments for operating the train from either one of said control stations, the indicators and control instruments at both stations and the

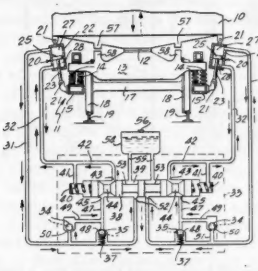
prime movers in both endmost cars being interconnected by electrical conductors extending throughout the length of the train and including interconnecting male and female plug connectors between each car, and wherein a third car normally coupled in the train between the endmost cars includes circuit modifying means for transposing certain of said conductors so that the indicators and control instruments at each of said control stations will present a similar array with regard to the prime mover in that car and the prime mover at the far end of the train, the improvement which comprises an adaptor plug for insertion between a male and female plug between adjacent cars when said third car is removed from the train, said adaptor plug including circuit modifying means similar to that of said removed third car.

3,868,910

RAILWAY CAR SUSPENSION MOTION CONTROL SYSTEM

John C. Schultz, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Nov. 26, 1973, Ser. No. 419,107
Int. Cl. B61f *3/08, 5/24, 5/50*
U.S. Cl. 105—164 **22 Claims**



1. A system for controlling operational vibrations of a railroad car body relative to its suspension, comprising:

double-acting hydraulic fluid displacement units of the rectilinear piston and cylinder type wherein the piston rod extends from one end of the piston and the opposite end of the piston is free within the cylinder and having means for coupling the units to and between the respective opposite sides of the car body and suspension;

means providing hydraulic displacement connections between said units;

first valve means in said connections automatically responsive to hydraulic pressure in said connections as generated by said units for controlling displacement through the connections and thus damping relative bounce and pitch motions between the car body and the suspension;

additional pressure-sensitive valve means in said connections inactive relative to bounce and pitch but operating automatically responsive to hydraulic pressure in said connections as generated by said units to damp roll motion between the car body and suspension; and

accumulator means in said hydraulic displacement connections to accomodate piston rod displacement in said units.

3,868,911

RAILWAY CAR SUSPENSION MOTION CONTROL SYSTEM

John C. Schultz, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed June 22, 1973, Ser. No. 372,851
Int. Cl. B61f *3/08, 5/24, 5/50*
U.S. Cl. 105—164 **22 Claims**

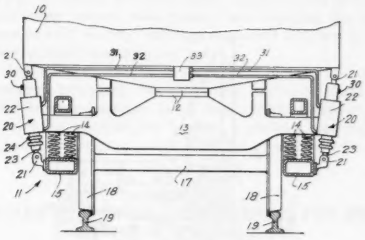
1. A system for controlling operational vibrations of a railroad car body relative to its suspension, comprising:

double-acting hydraulic fluid displacement units having means for coupling them to and between the respective opposite sides of the car body and suspension;

means providing hydraulic displacement connections between said units;

first valve means in said connections automatically responsive to hydrualic pressure in said connections as generated by said units controlling displacement through the connection and thus damping relative bounce and pitch motions between the car body and the suspension; and

additional pressure-sensitive valve means in said connections inactive relative to bounce and pitch but operating automatically responsive to hydraulic pressure in said connections as generated by said units to damp roll motion between the car body and suspension.

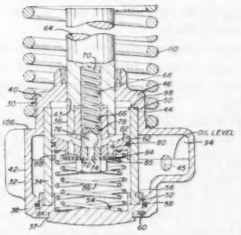


3,868,912

HYDRAULICALLY SNUBBED TRUCK

John H. Wagner, Bradfordwoods, and Donald Wiebe, Sewickley, both of Pa., assignors to A. Stucki Company, Pittsburgh, Pa.

Filed Apr. 27, 1973, Ser. No. 355,058
Int. Cl. B61f *5/12, 5/50;* **F16f** *9/32*
U.S. Cl. 105—197 DH **14 Claims**



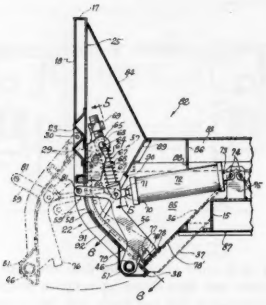
1. A snubber device comprising: a hollow housing; an annular cylindrical member releasably and rigidly received within said housing; a circumferential fluid reservoir defined by the inner periphery of said housing and substantially the entire outer periphery of an upstanding portion of said cylindrical member which is spaced therefrom; a piston assembly axially reciprocable within said cylindrical member; passageway means communicating between said reservoir and the interior of said cylindrical member adjacent the uppermost portion of said cylindrical member; said interior of said cylindrical member, said passageway means and said reservoir defining a closed hydraulic system for retaining a hydraulic fluid therein; and said passageway means being in communication with said reservoir below the operating level of the hydraulic fluid in said reservoir.

3,868,913

HOPPER VEHICLE

Peter W. Becker, Struthers; Albert E. Price, Brookfield; Erling Mowatt-Larssen, Warren, and Carl E. Becker, Masury, all of Ohio, assignors to General American Transportation Corporation, Chicago, Ill.

Filed Feb. 19, 1974, Ser. No. 443,217
Int. Cl. B61d *7/02*
U.S. Cl. 105—240 **32 Claims**



1. A hopper vehicle having a pair of bottom hoppers extending lengthwise of the vehicle on opposite sides of the vertical central plane of the vehicle, which comprises:

a supporting structure including support means extending from about one end of the vehicle to about the other end of the vehicle and located at the bottom portion of the vehicle for mounting on wheeled assemblies of the vehicle;

a body structure including:

end walls;

side walls;

an inverted generally V-shaped panel mounted on said support means and extending lengthwise of the vehicle and providing a part of said hoppers; and

a door assembly hingedly mounted at its upper margin on each of said side walls to swing outwardly and constructed to provide one side of one of said two hoppers of the vehicle;

a door-operating mechanism for each of said door assemblies and located intermediate the length of the door assembly, each of said door-operating mechanisms including:

a lever pivotally mounted at its bottom end on the bottom margin of said door assembly and having an inwardly directed extension that is constructed to function as a latching lug, said lever being movable between a first position abutting the inside of said door assembly when the door is unlocked and a second position spaced from the inside of said door assembly when the door is closed with said extension in its latching position to lock the closed door assembly;

power means mounted on said support means and operatively connected to said lever to provide a force in one direction for movement of said lever from said second position to said first position and to provide a force in the opposite direction on said lever for return movement of said door assembly to its closed position and subsequent movement of said lever from said first position to said second position; and

means operatively connected to said lever to provide against said lever, when in its first position, a sufficient force to prevent movement of said lever from said first position when said power means provides a force in said opposite direction greater than the force of gravity acting on door assembly for movement of said door assembly to its closed position; and

locking means mounted on said supporting structure in alignment with each of said levers to be engaged by said latching lugs provided by said extensions of said levers after said door assemblies are closed and said levers have been moved to their second positions,

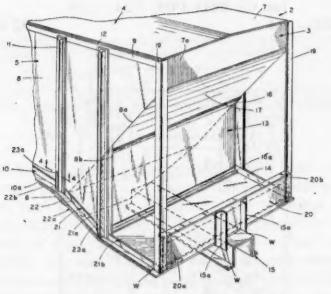
said locking means and said latching lugs being constructed so that when each of said levers is in its said first position and the door assembly on which it is mounted is being moved to said closed position said latching lug clears said locking means with which it is engaged when said lever is moved to its second position after the door is closed.

3,868,914

HIGH SIDE SILL RAILROAD CAR

Philip G. Przybylinski, Schererville, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Sept. 16, 1971, Ser. No. 181,140
Int. Cl. B61d *5/00, 7/00, 17/06*
U.S. Cl. 105—248 **8 Claims**



1. In a center sill-less railroad hopper car, a pair of opposed end portions and a central portion and side girders including side sills connecting with the end portions, each end portion comprising:

a stub center sill,

a flat horizontal shear plate beam mounted on the stub center sill below the side sills,

an upright bolster web beam mounted over a vehicle bolster and on the shear plate beam intermediate its ends,

said side sills each including a high side sill on each side of the car and extending through the central portion and into the end portions and spaced above the respective shear plate beams,

each side at each end portion of the car having a first side post lying generally in the plane of the bolster web beam and a second side post spaced inwardly of said first side post and a corner post at each end of the car,

each high side sill extending between each second side post and terminating lengthwise at each second side post,

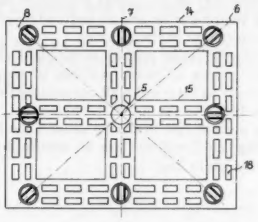
a sloped and lower side sill structure connecting with each end of a respective high side sill and including a sloped side part connecting with each free end of the respective high side sill and extending in sloping manner downwardly and outwardly and connecting with the lower ends of said first and second side posts, said sloped and lower side structure further including a lower stub side sill being generally horizontal and connecting with the outer end of each sloped side sill part and with a respective corner post, said lower stub side sill on each end and side of the car connecting with a respective shear plate beam and lying in the same general plane therewith below the high side sill,

each of said high side sills and each sloped and lower side sill structure forming a single continuous formed side sill structure.

3,868,915
PALLETS

Erich Hafner, 4811 Leopoldshohe, Doktorkamp 11, Germany

Filed Dec. 27, 1972, Ser. No. 319,082
Claims priority, application Germany, Dec. 29, 1971, 2165341
Int. Cl. B65d *19/32*
U.S. Cl. 108—51 **10 Claims**

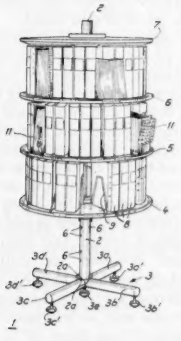


1. A pallet comprising an essentially flat upper part and an essentially flat lower part, said upper and lower parts having a common axis normal to the load bearing surface of the upper part and to the upper surface of the lower part, at least one of the parts including spacing pieces for maintaining the upper and lower parts in spaced relation, the upper part having a plurality of protrusions or depressions in a lower surface thereof each of which interengages with one of a corresponding plurality of depressions or protrusions on an upper surface of the lower part, each of a first group of said pluralities of said interengaging protrusions or depressions having an elongated longitudinal axis extending in a direction essentially along one of a plurality of radial lines projected from said common axis, and each of further groups of said pluralities of said interengaging protrusions or depressions having longitudinal axes extending in directions essentially along others of said plurality of projected radial lines, whereby relative movement of the two parts in a direction transverse to said surfaces is restrained, and means joining said upper and lower parts for connecting the two parts together while allowing limited relative movement therebetween.

3,868,916
SHELF CONSTRUCTION

Kurt Lennart Ohlson, Moravagon 27, 161 42 Bromma, Sweden

Filed July 2, 1973, Ser. No. 375,474
Claims priority, application Sweden, July 7, 1972, 8976/72
Int. Cl. A47b *49/00*
U.S. Cl. 108—103 **3 Claims**



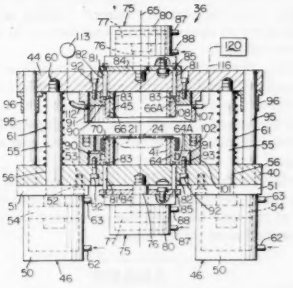
1. A rotatable shelf and the like comprising

a. a vertical stationary column;
b. a wheeled base supporting said column on a floor or similar support;
c. a sleeve surrounding said column;
d. a pair of vertically spaced bearing bushings rotatable about said column supporting the upper and lower ends of said sleeve at a spaced distance from the exterior surface of said column;
e. a pair of wheels mounted on the opposite ends of a shaft extending through said column and engaging the lower one of said bearing bushings to permit rotation of said sleeve about said column; and
f. a shelf member fixed to said sleeve for rotation about said column, extending therefrom in a horizontal direction, said bearing bushings being substantially L-shaped and having an annular slot forming a portion tapering upwardly towards the exterior surface of said column.

3,868,917
SEALED CONTAINER AND APPARATUS FOR AND METHOD OF SEALING SAME

Horst F. W. Arfert, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 272,059, July 14, 1972, Pat. No. 3,752,387, which is a division of Ser. No. 49,492, June 24, 1970, Pat. No. 3,695,806, which is a continuation-in-part of Ser. No. 854,108, Aug. 29, 1969, abandoned. This application June 15, 1973, Ser. No. 370,319
Int. Cl. B21d *51/26*
U.S. Cl. 113—1 E **10 Claims**



1. An apparatus for sealing a closure having a peripheral flange portion provided with an annular sealable surface against the top of a dish-like container having a top peripheral flange provided with a cooperating annular sealable surface wherein at least one of said sealable surfaces has adhesive means thereon, said apparatus comprising a fixed support, a container supporting ring carried by said fixed support and having an annular top surface adapted to support said flange, a movable support, an actuating device for moving said movable support toward and away from said fixed support, a clamping ring carried by said movable support for clamping said closure against said annular top surface, and a pair of cooperating dies each carried by an associated support and each being movable relative to its associated support, one of said dies being supported around said container supporting ring and being axially movable relative thereto and the other of said dies being supported around said clamping ring and being axially movable relative thereto, said dies and rings being adapted to be moved together so that said sealable surfaces are bonded together by said adhesive means to form a multiple thickness bonded lamination comprised of an annular portion of said flange and a corresponding annular portion of said closure and said dies being adapted to be then moved in one direction to first define a substantially tubular laminated section and adapted to be moved in an opposite direction to form said section in the form of an annular bead having

a roughly circular cross-sectional outline, said clamping ring having an outside surface which defines the inside surface of said tubular section and said one die having an inside surface corresponding to and being spaced outwardly from said outside surface by a controlled thickness determined by the thickness of said multiple thickness bonded lamination.

3,868,918

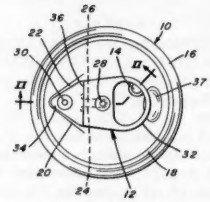
LOCK-DOWN FOR A PULL TAB ON A CONTAINER WALL

George L. Smith, Jr., Vandergrift, and Hans H. Diekhoff, Greensburg, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 212,562, Dec. 27, 1971, abandoned. This application Apr. 5, 1973, Ser. No. 348,155

Int. Cl. B21d *51/26*

U.S. Cl. 113—121 C **2 Claims**



1. A method for forming an embossed hook in a container wall for retaining a tab thereon comprising the steps of

forming a hemispherically-shaped bubble with a hollow protrusion on the projecting end thereof in a sheet metal container wall,

reforming the bubble into a boss having a substantially vertical side wall around approximately one-half of its perimeter, an end wall sloping toward the container wall from the top of said side wall, and an upwardly projecting hollow protrusion near the top of the end wall adjacent the side wall of the boss; and

reforming the boss into a hook for engagement over an edge of a tab by partially collapsing the boss and reforming the top of the side wall and the protrusion outward to form a rounded nose on the hook.

3,868,919

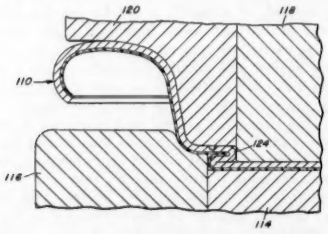
METHOD AND APPARATUS FOR FORMING EASY OPENING CONTAINER WALLS

Howard D. Schrecker, Hyde Park, and Hans H. Diekhoff, Greensburg, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 6, 1973, Ser. No. 422,292

Int. Cl. B21d *51/26*

U.S. Cl. 113—121 C **14 Claims**



1. In a method of forming a sheet metal easy opening container end wall having an annular score line therein defining a removable panel, an annular folded band in the removable panel adjacent the score line to shield the raw score edge on the panel after removal from the end wall, an upstanding chuckwall around the removable panel and a peripheral flange extending outwardly from the chuckwall for securement of the end wall to a container body, the steps comprising:

drawing the center portion of a generally circular sheet metal blank downwardly with respect to the peripheral edge portions of the blank,

drawing an annular U-shaped groove in the blank around the periphery of the center portion of the blank,

forming an annular lip and an upstanding chuckwall around the outer edge of the groove,

depressing the center portion of the blank and the inner wall of the groove to move portions of the groove radially outwardly to form a Z-wall connecting the center portion of the blank to the lip of the blank,

forming a score line in the lip around the blank and

collapsing the Z-wall to form an annular folded band adjacent the score line.

3,868,920

SEMI-SUBMERGED CARGO TRANSPORT SYSTEM

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Air Logistics Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 74,820, Sept. 23, 1970, abandoned. This application Nov. 1, 1971, Ser. No. 194,633

Int. Cl. B63g *8/00*; **B63b** *35/12*

U.S. Cl. 114—16 R **46 Claims**

1. A transport system for the transportation of cargo under the surface of the ice which comprises:

a. a submergible cargo vessel comprising:

i. a navigational section containing means to adjust the depth of travel of said vessel;

ii. a cargo section containing a plurality of compartments for the storage of cargo, means to load said cargo compartments and means to maintain the vessel at a slight positive buoyancy during transit;

b. means to propel said vessel, said means containing the prime source of power and comprising:

i. a submergible propulsion section;

ii. a surfaced bridge containing at least means to monitor and control the operation of the transport system and quarters for the operating crew;

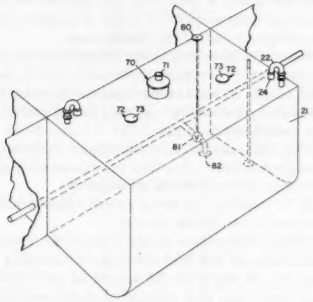
iii. a mast rigidly connected to said propulsion section and said surfaced bridge, said mast containing forwardly positioned powered ice cutting means movably mounted on said mast to chop ice into chips and form a path through ice which is at least coextensive with the width of said mast, at least said ice cutting means being at an angle of from about 10° to about 45° to the vertical in the bow direction to eliminate a pitch force due to the ice chopping function of said powered ice cutting means.

3,868,921

NORMALLY VENTED LIQUID-STORAGE TANK FOR SHIPS, WITH CLOSURE DEVICE FOR AUTOMATICALLY PREVENTING LEAKING IF THE SHIP SHOULD SINK

David Jackson Seymour; Norman MacRitchie, both of San Francisco; Parker J. Matthews, Millbrae, all of Calif., and Thomas A. Clark, Seattle, Wash., assignors to Jon G. Bowman; William E. Boeing and Wells McCurdy, part interest to each

Filed June 14, 1972, Ser. No. 262,741
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 R **20 Claims**



1. A shipboard storage tank for liquids, comprising in combination

a vent and overflow conduit having an outlet, and

an anti-pollution valve installed in said conduit and comprising

closure means for automatically closing said conduit against the passage of liquids to said outlet,

latching means for normally latching said closure means in the open position so as normally not to interfere with venting and overflow functions,

pressure-actuated means for unlatching said latching means upon the application thereto of a predetermined pressure well above atmospheric pressure,

a control conduit leading from the atmosphere to said pressure-actuated means and having orifice means therein preventing actuation of said pressure actuated means by transient effects while enabling prompt actuation by the permanent hydrostatic pressure exerted by water when the ship sinks, and

biasing means for normally holding the closure means closed after said unlatching, said biasing means including means for momentarily opening said closure means for inflow of ambient water through the outlet and into the interior of the storage tank when the ambient pressure outside the storage tank exceeds the internal pressure within the storage tank by an amount greater than the force exerted on the closure means by the biasing means.

3,868,922

AUTOMATIC LATCH/UNLATCH MECHANISM

William E. Schulz, Westlake Village, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

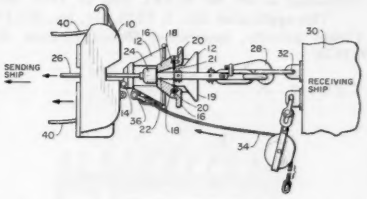
Filed Apr. 10, 1974, Ser. No. 459,741
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 A **7 Claims**

1. An automatic latch/unlatch mechanism comprising:

a. a probe having a head;

b. a housing having an opening capable of permitting the insertion and exit of said probe; and

c. means pivotally attached to said housing for engaging said probe head and preventing said probe's extraction therefrom when said probe head is inserted into said housing a specific first distance and then moved in the opposite direction a specific second distance, but allowing said



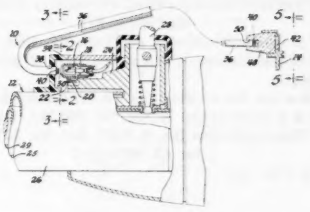
probe's extraction therefrom after said probe head is inserted into said housing said specific first distance, then moved in the opposite direction said specific second distance, and then inserted into said housing a specific third distance.

3,868,923

GEARSHIFT INDICATOR ARRANGEMENT

Theodore Lambiris, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 23, 1973, Ser. No. 408,805
Int. Cl. G09f *9/00*
U.S. Cl. 116—124 R **5 Claims**

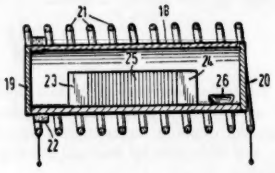


1. A vehicular gearshift indicator arrangement comprising a rotatable shift bowl-mounted light source, means for concentrating the light rays from said light source, a stationary housing having an open side thereof positioned adjacent said means, a plurality of arcuately aligned openings formed in a wall of said stationary housing opposite said open side, a plurality of fiber optic bundles, each of said bundles including a plurality of fiber optic tubes and each bundle being secured adjacent one end thereof in one of said arcuately aligned openings, an instrument panel-mounted transparent display dial, a plurality of spaced indicia formed on said display dial, there being predetermined lengths of spaces intermediate adjacent indicia, an instrument panel-mounted mounting block secured adjacent said indicia and said intermediate spaces, and a plurality of openings formed in said mounting block aligned respectively with said indicia and with said intermediate spaces, said plurality of fiber optic bundles being secured at their other ends in said plurality of openings, said bundles aligned with said indicia including a predetermined quantity of said fiber optic tubes while said bundles aligned with said intermediate spaces include a quantity of said fiber optic tubes less than said predetermined quantity such that the illumination of said intermediate spaces is at a lesser intensity than that of said indicia upon selected rotation of said shift bowl-mounted light source.

3,868,924
APPARATUS FOR INDIFFUSING DOPANTS INTO SEMICONDUCTOR MATERIAL

Konrad Reuschel, Vaterstetten; Wolfgang Keller, Pretzfeld; Arno Kersting, Erlangen, and Reimer Emeis, Ebermannstadt, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin/Munich, Germany

Continuation of Ser. No. 50,087, June 26, 1970, abandoned. This application Oct. 5, 1972, Ser. No. 295,173
Claims priority, application Germany, June 30, 1969, 1933128
Int. Cl. C23c *13/08*
U.S. Cl. 118—49 4 Claims

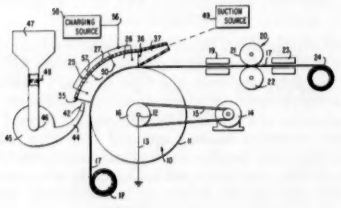


1. Apparatus for indiffusing dopants into a semiconductor material which comprises a heatable tube of the same semiconductor material in which the semiconductor material is accommodated and in which the doping substance is found, the wall of the tube is from 0.5 to 20 mm thick, is virtually gas-tight under diffusion conditions, a relatively narrow high conductivity ring is on said heatable tube, and an induction coil surrounds the circumference of said heatable tube.

3,868,925
ELECTROSTATIC COATING OF METAL POWDER ON METAL STRIP

Edwin J. Smith, Winterville, and Robert B. Reif, Grove City, both of Ohio, assignors to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 63,896, Aug. 14, 1970, Pat. No. 3,745,034, which is a continuation of Ser. No. 660,787, Aug. 15, 1967. This application Jan. 8, 1973, Ser. No. 321,937
Int. Cl. B05c *5/02*
U.S. Cl. 118—621 1 Claim



1. Apparatus for applying a metal powder coating on metal strip comprising

means including non-electrically conductive wall means defining an elongated passageway having an entrance opening and an exit opening,

means for continuously moving metal strip to be coated through the passageway in a direction from the entrance opening to the exit opening and in out-of-contact relation with the wall means,

a plurality of charging wires in the passageway spaced longitudinally of the passageway in the direction of movement of the metal strip through the passageway, each charging wire extending transversely of the passageway and of the metal strip moving through the passageway,

a charging circuit for the charging wires including the metal strip and a source of charging potential connected to the charginig wires,

means for supplying a stream of carrier gas,

means for holding a supply of metal powder,

means for controlling flow of the metal powder from the last claimed means,

means for flowing metal powder from the supply into the carrier gas to suspend metal powder in the carrier gas to form a cloud of metal powder,

means for introducing the cloud of metal powder into the entrance opening of the passageway generally in the direction of the movement of the strip through the passageway, with metal powder suspended in gas passing between the charging wires and the metal strip, and

means including a source of gas suction for withdrawing metal powder suspended in gas at a point contiguous to the strip exit end of the passageway,

the means for introducing the cloud of metal powder into the entrance opening including

nozzle means located contiguous to the entrance opening and having a discharge opening facing in the direction of the entrance opening,

the cross-sectional area of the nozzle at its discharge end being substantially less than the crosssectional area of the entrance opening of the passageway,

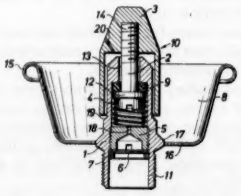
means for feeding the metal powder suspended in the carrier gas to the nozzle means,

the relative shapes and dimensions of the nozzle means at the discharge end and the entrance opening of the passageway, acting with the source of gas suction, causing the carrier gas and suspended metal powder to induce ambient air to flow into the entrance opening.

3,868,926
AUTOMATIC WATER DISPENSER

Jarl Rune Olde, Laduvagen 4, 752 47 Uppsala, Sweden

Filed July 18, 1973, Ser. No. 380,492
Claims priority, application Sweden, July 31, 1972, 9969/72
Int. Cl. A01k *07/00*
U.S. Cl. 119—75 7 Claims



1. An automatic water dispenser for small-mouthed animals, in particular poultry, comprising in combination an open-topped drinking bowl and a vertically extending valve device centrally disposed in said bowl for supplying water to the interior thereof, said valve device including an open-ended hollow body member fixed to the bottom wall of said bowl and having means at its lower open end for securing it to a source of water supply with its upper open end projecting above the horizontal plane of the top edge of said bowl, whereby the bore of said body member serves as a conduit for flow of water from said source to and through the top open end of said member, a valve seat formed interiorly of said body member intermediate its opposite open ends, a valve member operatively associated with said valve seat having a stem extending axially through said valve seat and the upper end portion of said body member, biasing means in said body member for normally biasing said valve member into valve-closing engagement with said valve seat, the bore through said upper end portion of said body member being of a diameter sufficiently greater than that of said valve stem as to permit the latter to

be canted relatively to the axis of said last-mentioned bore against the restraining bias of said biasing means and thereby tilt said valve member into an open position relatively to its seat, and a hook-like member secured to the free end of said valve stem adapted to be engaged by the mouth or beak of the animal to thereby tilt said valve member into valve-opening position and so effectively enable water to be supplied to said bowl, said hood-like member being provided with a downwardly presenting socket disposed in concentric relation to said body member and having walls which spatially surround the upper portion of said body member to provide an annular passage between said body member and the surrounding walls of said socket for delivery of drinking water from the upper open end of said body member downwardly into said drinking bowl.

3,868,927

COMBUSTION CHAMBER

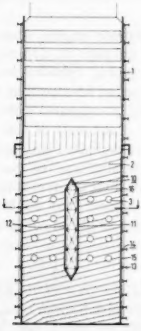
Georg Lösel, Uttenreuth, and Leonhard Eickenberg, Berlin, both of Germany, assignors to Kraftwerk Union AG, Mulheim/Ruhr and Borsig GmbH, Berlin, both of, Germany

Filed Oct. 15, 1973, Ser. No. 406,289

Claims priority, application Germany, Oct. 19, 1972, 2251396

Int. Cl. F22b *31/04*

U.S. Cl. 122—240 R **5 Claims**



1. A combustion chamber of a steam generator comprising combustion chamber walls, said walls being formed of tubes disposed substantially horizontally, a partition subdividing the combustion chamber and comprising two adjacent walls, said adjacent walls being each formed of tubes disposed in a manner similar to the tubes of the combustion chamber walls, each end of each tube of said partition being connected to a tube of the combustion chamber walls.

3,868,928

IGNITION SYSTEM FOR ROTARY INTERNAL COMBUSTION ENGINE

Kyuji Kishimoto; Toshiaki Tojima, and Hideto Ishii, all of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

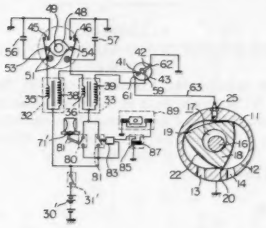
Filed Oct. 3, 1972, Ser. No. 294,585

Claims priority, application Japan, Oct. 7, 1971, 46-78998

Int. Cl. F02b *5/04*

U.S. Cl. 123—8.09 **4 Claims**

1. In an ignition system for a rotary internal combustion engine including an ignition switch, two ignition coils each having a primary winding and a secondary winding, two breakers each connected to the respective primary winding of each of the ignition coils, a spark plug for normally igniting a combustible air-fuel mixture in each consecutive compression chamber of the engine, a distributor for selectively connecting the secondary windings of the ignition coils to the spark plug to cause a spark to be incident to the opening of the breakers, and cams driven by the engine for opening the breakers, the improvement comprising an electromechanical switch member connected between one of the ignition coils and the ignition switch and responding to deceleration and idling conditions of the engine for controlling the firing of the spark plug to produce a spark in alternate compression cycles, in which



the electromechanical switch member for controlling the firing of the spark plug comprises a first normally closed switch connected between the ignition switch and one of the ignition coils, and a second normally closed switch connected in parallel with the first switch, the first switch being opened when the degree of throttle opening is of such a value as when the engine is idling, the second switch being opened when engine speed exceeds a predetermined value.

3,868,929

LUBRICATING OIL SUPPLY SYSTEM FOR ROTARY ENGINE

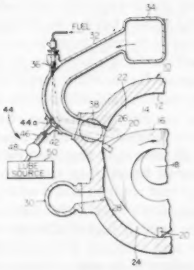
Yoshikazu Ishikawa, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Apr. 2, 1973, Ser. No. 346,763

Claims priority, application Japan, Apr. 3, 1972, 47-33327

Int. Cl. F01c *21/04*

U.S. Cl. 123—8.09 **1 Claim**



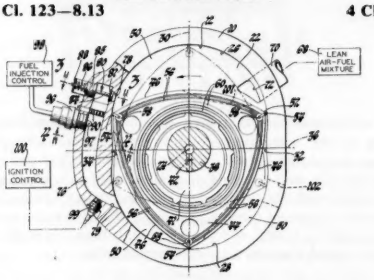
1. In combination with a rotary internal combustion engine of the fuel injection type having an intake port, a mixture supply pipe connected to an air inlet and communicating with said intake port, a fuel injection nozzle mounted in said mixture supply pipe downstream of said air inlet and adapted for injecting fuel toward a limited part of a wall of said mixture supply pipe downstream of said fuel injection nozzle, a lubricating oil supply system comprising a source of lubricating oil, a metering pump communicating with said source of lubricating oil, a lubricating oil supply pipe communicating with said source of lubricating oil through said metering pump, a lubricating oil supply unit mounted on an outer wall of said mixture supply pipe and having a lubricating oil distributing chamber communicating with said lubricating oil supply pipe and opening into said mixture supply pipe at the limited part thereof,

and a diffuser mounted in the wall of said mixture supply pipe at the limited part thereof in the path of fuel spray from said fuel injection nozzle, said lubricating oil distributing chamber of said unit distributing lubricating oil into said mixture supply pipe through said diffuser, whereby the lubricating oil is uniformly diffused into fine droplets which are mixed with the mixture of air and fuel to be supplied to the engine.

3,868,930
ROTARY ENGINE WITH AUXILIARY COMBUSTION CHAMBER

Edward D. Klomp, Mt. Clemens; James H. Wolgemuth, and Harold V. Wiknich, both of Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 24, 1974, Ser. No. 472,943
Int. Cl. F02b *53/04*
U.S. Cl. 123—8.13 **4 Claims**

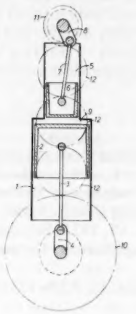


1. A rotary combustion engine comprising housing means having opposing end walls and a peripheral wall cooperatively defining a cavity, a crankshaft rotatably supported in said housing means having an eccentric located in said cavity, for providing a fixed speed ratio between said rotor and said crankshaft so that said crankshaft is caused to rotate as said rotor executes planetary motion with a fixed cyclic relationship, said peripheral wall and said rotor cooperatively defining with said end walls a plurality of working chambers that are spaced about and move with said rotor while varying in volume, said housing means having an intake port open to said cavity located relative to rotor rotation so as to be opened past said rotor to said working chambers as they expand in an intake phase, lean air-fuel mixture supply means for supplying a lean air-fuel mixture to said intake port, said housing means further having an auxiliary combustion chamber with an inlet open to said cavity located so as to be opened past said rotor to said working chambers as they contract in a compression phase and having an outlet open to said cavity located so as to be opened past said rotor to said working chambers as they expand in an expansion phase, check valve means in said inlet for permitting the lean air-fuel mixture in said working chambers to flow into said auxiliary combustion chamber above a predetermined pressure as said working chambers are contracting and preventing flow in the opposite direction, fuel injection means for injecting fuel into the lean air-fuel mixture in said auxiliary combustion chamber downstream of said check valve means after the working chamber from which the lean air-fuel mixture has been obtained opens to said outlet of said auxiliary combustion chamber, ignition means for igniting the enriched air-fuel mixture in said auxiliary combustion chamber while the working chamber from which the lean air-fuel mixture was obtained remains open to said outlet of said auxiliary combustion chamber, flame arrestor means between said fuel injector means and said check valve means for preventing flame in said auxiliary combustion chamber from progressing through said check valve means while open and then said inlet into said working chambers as they are contracting, and said housing means having an exhaust port open to said cavity at a location so as to be opened past said rotor to said working chambers as they contract in an exhaust phase.

3,868,931
INTERNAL COMBUSTION ENGINE

Jean Ernest Dutry, Steenweg op Brussel, 340, 1900 Overijse, and Alfred Hubert Feyens, Avenue Prince Baudouin 9, 1150 Brussels, both of Belgium

Filed July 16, 1973, Ser. No. 379,816
Claims priority, application Belgium, July 18, 1972, 11994
Int. Cl. F02b *75/04*
U.S. Cl. 123—51 R **6 Claims**

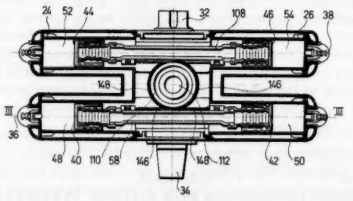


1. Internal combustion engine wherein there is associated with each working cylinder an additional cylinder communicating with the working cylinder and containing a piston which displaces a smaller volume than that of the piston of the working cylinder and co-operates with a crankshaft connected positively with the crankshaft of the piston of the working cylinder, the two crankshafts being angularly offset relatively to one another, characterised in that the frequency of the rotation of the crankshaft co-operating with the piston of the additional cylinder is more than double that of the crankshaft co-operating with the piston of the working cylinder.

3,868,932
RECIPROCATING ENGINE

Jozsef Toth, 76, Oprendek Sandor utca, Miskolc III, Hungary

Filed July 21, 1972, Ser. No. 273,665
Int. Cl. F02b *75/28, 75/32*
U.S. Cl. 123—54 B **1 Claim**



1. A reciprocating engine comprising in combination a rigid structure, a drive shaft with an axial center line, means supporting said drive shaft in said rigid structure for rotation about said axial center line, two pairs of work cylinders arranged in said rigid structure pairwise along two substantially parallel lines equidistant from and substantially at right angles to said axial center line, the cylinders of each pair being coaxial and opposed to each other, work pistons arranged for reciprocating motion in each said work cylinders and defining work chambers therewith, a piston rod extending between the pistons of each said pair of cylinders, means yieldably interconnecting the pistons of each said pair of cylinders to opposite ends of the associated said piston rod, means for alternately admitting and withdrawing a work medium into and from said work chambers dependent on the mutual positions

of associated work pistons and cylinders, power transmission means between said work pistons and said drive shaft for ensuring opposite reciprocating movements of said piston rods and for rotating said drive shaft in response to said reciprocating movements, said power transmission means including one-way motion transmission means for effecting unidirectional rotation of said drive shaft upon reciprocating movement of said work pistons, said one-way motion transmission means comprising a cam and roller free wheel mechanism, fuel injection means on each work cylinder, and control means for operating said fuel injection means, said control means comprising cam means on said piston rods and actuating linkages with rollers arranged for engaging said cam means, said power transmission means comprising flexible bands secured at their opposite ends adjacent opposite ends of said piston rods and drivingly surrounding said drive shaft.

3,868,933

COMBUSTION MOTOR

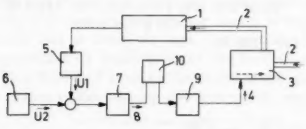
Erhard Bigalke; Werner Buttgereit, and Dieter Pundt, all of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 90,606, Nov. 18, 1970, abandoned. This application Sept. 20, 1972, Ser. No. 290,626

Claims priority, application Germany, Nov. 22, 1969, 1958816

Int. Cl. F02d *11/10*; **B60k** *27/00*

U.S. Cl. 123—102 **3 Claims**



1. A combustion motor comprising an air intake canal, throttle valve means in said canal determining the rate of air flow through said canal, a throttle valve switch operatively connected to said throttle valve means, said switch being closed during deceleration operation of the motor and said throttle valve means being moved into its closed position during deceleration operation of the motor and idling, a device for automatically controlling the motor speed during operation modes of the motor different from load and deceleration fuel shut off, said device comprising by-pass canal means bypassing said throttle valve means, a control throttle disposed in said by-pass canal means and comprising an electrical positioning arrangement, first means for measuring the actual value of the motor speed and deriving an electrical actual value signal therefrom, second means for providing an electrical desired value signal corresponding to the desired value of the motor speed, difference deriving means having input and output means, said first and second means being operatively connected to said input means of said difference deriving means, said positioning arrangement of said control throttle being operatively connected to said output means, switching means operatively connected to said input means, said switching means comprising a semiconductor device having a control electrode connectable via said throttle valve switch to an electrical potential adapted to block said semiconductor device and further connected to an electrical circuit point having an electrical potential also adapted to block said semiconductor device only during deceleration fuel shut off, said input means being connectable via said semiconductor device to an electrical potential adapted to block said difference deriving means, whereby during load operation and deceleration fuel shut off no electrical signal representing the difference between actual value and desired value of the motor speed is fed to said positioning arrangement from said difference deriving means.

3,868,934

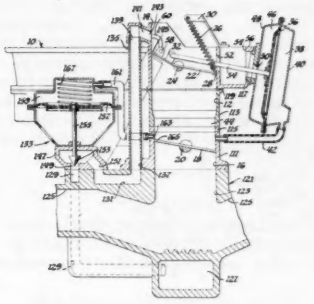
EXHAUST GAS RECIRCULATION

Stanley H. Mick, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1973, Ser. No. 343,555

Int. Cl. F02m *25/00*

U.S. Cl. 123—119 A **2 Claims**



1. An internal combustion engine comprising an induction passage for air flow to the engine, an air valve disposed in said induction passage and rotatable between closed and open positions, means controlling said air valve to maintain a substantially constant pressure in a region of said induction passage downstream from said air valve, an exhaust passage for exhaust gas flow from the engine, and an exhaust gas recirculation passage extending from said exhaust passage to a port disposed in said induction passage adjacent the upstream edge of said air valve when said air valve is in said closed position and traversed by the upstream edge of said air valve as said air valve is rotated from said closed position to said open position whereby when said air valve is in said open position exhaust gases are recirculated into a region of substantially constant pressure in said induction passage to thereby provide recirculation of exhaust gases at a rate proportional to the rate of air flow, and whereby the proportion of exhaust gas flow to air flow may be increased from a minimum when said air valve is in said closed position to a selected value as the upstream edge of said air valve traverses said port.

3,868,935

AUTOMATIC CHOKE

Bernard Liebman, Pittsford, and David W. Rucinski, Rochester, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

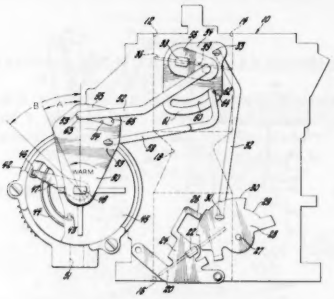
Filed Dec. 14, 1973, Ser. No. 424,883

Int. Cl. F02m *1/10*

U.S. Cl. 123—119 F **1 Claim**

1. For use in an internal combustion engine, a carburetor comprising an air intake, a throttle rotatably disposed in said air intake for controlling air flow to the engine, a throttle lever secured to said throttle for concomitant rotation through a selected path, a cam disposed in said path for variaoly limiting the rotation of said throttle lever in a throttle closing direction and thus controlling the idling position of the throttle valve, a choke shaft rotatably disposed in said air inlet anterior said throttle, a choke valve secured to said choke shaft, a choke lever secured to said choke shaft, a cam lever having an arcuate slot and rotatably disposed about said choke shaft, a cam link operatively connecting said cam lever and said cam, and positioning means responsive to temperature and including a housing, a thermostat shaft rotatably disposed in and extending through said housing, a bimetallic coil enclosed within said housing and having one end anchored to the housing and further having the other end positioning said thermostat shaft, a thermostat lever secured at one end to said thermostat shaft

outside said housing and having an arcuate slot adjacent the opposite end, a first link extending from said slot in said thermostat lever to said choke lever for limiting the opening of said choke valve, and a second link extending from the middle of said thermostat lever to said slot in said cam lever; whereby as the temperature responsive positioning means warms, said



coil permits said thermostat lever, said first link, and said choke lever to allow said choke valve to blow open, whereby as said thermostat lever moves, said second link, said cam lever, said cam link and said cam move under their own weight to allow said throttle lever to close said throttle, and whereby said choke valve is permitted to open before said cam is permitted to come off.

3,868,936

FUEL INJECTION SYSTEMS

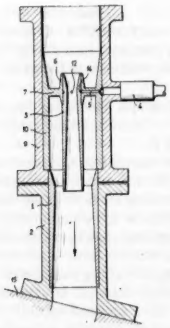
Jean-Pierre Rivere, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobile Peugeot, Paris, both of, France

Filed Mar. 16, 1972, Ser. No. 235,154

Claims priority, application France, Mar. 19, 1971, 71.09785; Jan. 27, 1972, 72.02682

Int. Cl. F02d *5/02*

U.S. Cl. 123—139 AW **5 Claims**



3. A device for feeding internal combustion engines by indirect injection applied independently to each cylinder into an induction pipe upstream of an inlet valve, comprising;

a. a first set of concentric stepped venturi means, disposed upstream of said inlet valve of each cylinder in an induction choke, for providing a substantially sonic gaseous flow of air;

b. a first adjustable injection means for delivering metered amounts of fuel at high engine speeds through an injection passage into the neck portion of the central venturi means of said first set of stepped venturi means, wherein an adjustable quantity of fuel is injected into the gaseous flow of air induced by said first set of stepped venturi means and wherein said central venturi means includes an external cylinder having a shoulder in which a circular groove is formed, and said first adjustable injection means includes a radial feed passage connected to said circular groove, said shoulder being fitted into a supporting socket, said central venturi means having at least two radial holes formed in diametrally opposite positions and symmetrically, in relation to said radial feed passage for interconnecting said circular groove and said neck portion of said central venturi means; and

c. a second adjustable injection means for delivering fuel at idling and low engine speeds into said induction pipe downstream of said first set of concentric stepped venturi means.

3,868,937

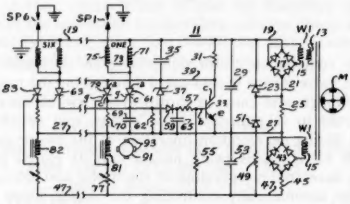
IGNITION SYSTEM WITH IMPROVED TRIGGERING CIRCUIT

Richard Zechlin, Beloit, and Robert M. Henderson, William Bay, both of Wis., assignors to Colt Industries Operating Corp. (formerly Fairbanks Morse, Inc.), New York, N.Y.

Filed Dec. 20, 1972, Ser. No. 316,735

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 R **7 Claims**



1. An ignition system for generating ignition pulses for the spark plugs of an associated engine comprising, in combination, a storage capacitor, means for charging said capacitor to a predetermined level, an ignition transformer winding connected to said storage capacitor, a coupling capacitor circuit connected to be charged in parallel with said storage capacitor, a circuit for selectively discharging said storage capacitor including first and second solid state selectivity conductive devices, triggering means including rotatable means driven by the associated engine for developing cyclic triggering pulses and for imposing said pulses to trigger said first device to conduction, said first device connected in a series circuit including said coupling capacitor, said second device connected in a series circuit including said storage capacitor and said winding, and the first device being connected to control the initiation of conduction of said second device whereby when said triggering means triggers said first device to conduction, said storage capacitor initially discharges through said coupling capacitor and said first device, thereby first causing said first device to become conductive and initiate conduction of said second device and enabling said storage capacitor to provide its principal discharge through said second device and said winding to thereby initiate an ignition pulse.

3,868,938

TRANSISTOR IGNITION SYSTEM

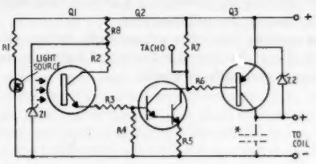
Alan Neville Trass, 44 Moyran Pile-2232, Grays Point, New South Wales, Australia

Continuation-in-part of Ser. No. 220,085, Jan. 24, 1972, abandoned. This application May 16, 1974, Ser. No. 470,675

Claims priority, application Great Britain, Feb. 11, 1971, 4460/71; Australia, Jan. 20, 1972, 38106/72

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E **8 Claims**



1. A transistor ignition system, comprising:

means for controlling the timing of pulses delivered to an ignition coil; and

a transistor amplifier circuit coupled between said controlling means and said ignition coil and having positive feedback means coupled thereto for causing said amplifier circuit to produce an oscillatory voltage when the rate at which pulses are delivered to said ignition coil is relatively low and producing only single voltage pulses when said rate is relatively high, said positive feedback being provided by breakdown of the field of said coil, whereby a shower of sparks is produced at the spark plugs of the engine under starting and low speed conditions.

3,868,939

FUEL INJECTION SYSTEM ESPECIALLY FOR COLD STARTING AND WARMING UP EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINES

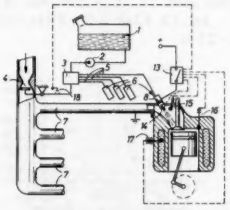
Karl-Hermann Friese, Leonberg; Friedbert Michel, Kornwestheim; Rudolf Krauss, Stuttgart; Gunther Jaggle, Stuttgart; Gerhard Stumpp, Stuttgart; Josef Steiner, Stuttgart, and Heinrich Knapp, Leonberg-Silberberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 2, 1973, Ser. No. 337,571

Claims priority, application Germany, Mar. 3, 1972, 2210250

Int. Cl. F02b *3/00*

U.S. Cl. 123—179 L **22 Claims**



1. In an internal combustion engine of the type having a combustion space and a fuel injection system comprising:

a. a discharge outlet for fuel to be injected and brought to said combustion space;

b. an electrical heating element for heating fuel to be injected, directly upstream of said discharge outlet;

c. a fuel entry means for feeding fuel into said heating element; and

d. temperature control means for controlling the heating of said fuel by said heating element, dependent on an engine temperature influencing the formation of a fuel/air mixture in said combustion space, said temperature control means causing the fuel to be heated, at temperatures below the optimal operational temperature of the engine, to such a degree that the preponderant portion of the amount of fuel to be injected is converted to the gaseous phase at the latest immediately after leaving said discharge outlet;

the improvement of said injection system comprising further an internal space adapted for the flow of fuel therethrough and extending from said fuel entry means to said discharge outlet, said space having a volume smaller than the volume of fuel injectable during about eight work cycles of said engine while the latter is idling.

3,868,940

INLET PORT FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR FOR DIESEL ENGINES

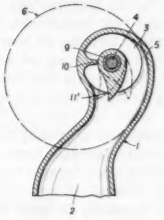
Karl Kirchweger, 87, Krottenhofstrasse, Graz, Austria (A 8010)

Filed Apr. 23, 1973, Ser. No. 353,575

Claims priority, application Austria, Sept. 15, 1972, 7961/72

Int. Cl. F02b *31/02*; **F02m** *35/10*

U.S. Cl. 123—188 M **4 Claims**



1. An internal combustion engine comprising:

at least one cylinder;

an inlet duct leading to the cylinder and having a circular aperture open to the cylinder;

an intake valve with a valve stem located within the inlet duct, said intake valve being eccentrically arranged in relation to the cylinder;

a valve guide bearing encompassing the valve stem;

said inlet duct including a feed duct for the admission of air for combustion and an adjoining annular chamber wound in a spiral-shape around the valve stem sloping off towards the circular aperture of said inlet duct;

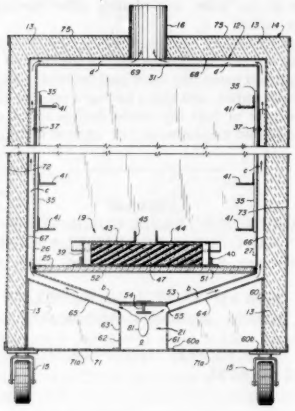
a partition in said annular chamber extending from a section of the inner boundary wall of the inlet duct and lying in a plane containing the axis of the valve stem and dividing said annular chamber into two compartments; and

an airfoil-shaped member extending from said valve guide bearing in an upstream direction of said feed duct and dividing the feed duct into two separate branches, each of said branches being connected with one of the compartments of said annular chamber and said airfoil-shaped member being curved in the direction of the winding of the spiral-shaped portion of said inlet duct.

3,868,941
HEAT-HOLDING APPARATUS

Ronald R. Roderick, Evergreen, Colo., assignor to National Equipment Corporation, Denver, Colo.

Filed June 15, 1973, Ser. No. 370,328
Int. Cl. A21b *1/02*
U.S. Cl. 126—19 R **10 Claims**



1. In heat-holding apparatus for food and the like, the combination comprising:

an inner heat-holding compartment made of heat conductive material having bottom, top, opposed side and opposed front and rear imperforate walls connected in a box-like structure forming an inner substantially closed space, said front wall having an access opening, at least one movable door across the front wall for selectively closing off the compartment and providing access thereinto;

a layer of heat insulation extending across the bottom of the compartment and a generally truncated, V-shaped deflector with inclined sides located below the layer of heat insulation and forming a closed air space therebetween to limit the heat upwardly through the bottom wall to the extent necessary to provide a substantially uniform temperature along and heat transfer through the bottom, top and side walls of the compartment;

a source of heat under the deflector for producing heated gases;

an outer jacket for the heating of the compartment including jacket wall portions spaced from the side walls of the compartment to provide side flow passages on each side thereof, an upwardly and outwardly inclined lower baffle on each side of the burner terminating at their upper ends at the lower ends of jacket wall portions to provide upwardly inclined lower flow passages communicating with the side flow passages and a top jacket wall portion spaced from the top wall to provide a top flow passage in communcation with the side flow passages and leading through a top outlet in the top jacket wall portion; and

an outer housing and heat insulation outside the jacket to reduce heat loss from the inner compartment.

3,868,942
COOKING APPARATUS

Almor Lewis, 4398 Seebaldt, Detroit, Mich. 48204

Filed Jan. 10, 1972, Ser. No. 216,656
Int. Cl. A47j *37/07;* **F24b** *3/00*
U.S. Cl. 126—25 R **1 Claim**

1. In an outdoor barbecue apparatus the improvements comprising:

a right circular cylindrical drum member having a substantially uniform diameter throughout its length and having a central axis extending horizontally;

said drum member having end flat circular faces in a vertical plane;

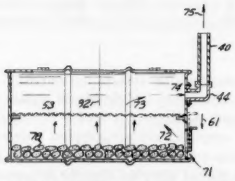
a hinged lid having a lip on the lower edge thereof, the upper half of said drum member being hinged and rotatable about a horizontal axis directly above and parallel to said central axis;

brackets extending horizontally inward slightly below the lip of said hinged lid;

means limiting the downward travel of said hinged lid;

a grille resting on said brackets;

a first venting assembly substantially below said grille on one of said flat circular faces and having a slidable door slidable vertically upwards;



a knob on said slidable door for manual actuation of the door;

a chimney member having a vertical opening above said grille at one end of said drum in the face thereof;

said chimney member selectively extending vertically upward from said opening;

foldable legs supporting said drum;

a silver colored heat resistant paint provided on the exterior surfaces and interior surfaces of the drum member;

said grille being divided into substantially two equal portions;

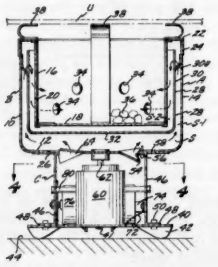
said foldable legs being foldable so as to substantially reduce overall height of the barbecue apparatus during moving of the apparatus;

said slidable door having sufficient friction with brackets holding said door to side of said drum, operable to hold said door in a preselected manually placed position.

3,868,943
PORTABLE FORCED DRAFT SOLID FUEL BURNING COOKER

Fred W. Hottenroth, 1740 Interlachen, Seal Beach, Calif. 90740, and Fred W. Hottenroth, III, 3415 Lama Ave., Long Beach, Calif. 90808

Filed June 21, 1974, Ser. No. 481,500
Int. Cl. F24b *3/00;* **F24c** *1/16*
U.S. Cl. 126—25 R **8 Claims**



1. A portable forced draft solid fuel burning cooker that may be selectively disposed in either a first compact position for ease of transportation or in a second position in which said

cooker is capable of supporting and heating a cooking utensil, which cooker includes:

a. a metallic heater assembly that includes a first outer cup shaped shell, a second inner cup shaped shell in which the solid fuel is disposed when the cooker is in said second position, a ring that joins free peripheral edges of said first and second shells, said second shell of substantially less transverse area than said first shell and said first and second shell cooperating with said ring to define a confined space of which a portion is of annulus shape, a third cup shaped shell interposed in a fixed position between said first and second shells that subdivides said confined space into inner and outer passages in which air is preheated by the combustion of said fuel after said air enters a first opening in said first shell in the portion thereof most remote from said ring to flow through said first and second passages and discharge from a plurality of spaced second openings in said second shell transversely across said fuel to support the combustion of the latter, and first means for supporting said third cup shaped shell in said fixed position;

b. a blower assembly that removably supports said heater assembly thereon when said cooker is in said second position, said blower assembly including a base of greater area than the transverse interior area of said second shell, electrically operated blower means mounted on said base for discharging a current of air through said first opening to flow through said first and second passages, said electrically operated blower means of such size as to be disposed within said second shell when the latter is free of fuel and said cooker occupies said first position with said base supported by said ring;

c. engaging means on said ring; and

d. engageable means on said base that removably engage said engaging means when said cooker is in said first position to hold said heater assembly and blower assembly together as an integral unit for ease of transportation.

3,868,944

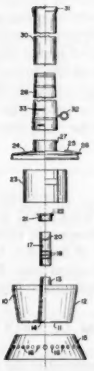
GROVE HEATER APPARATUS

James L. Hobby, deceased, late of P.O. Box 632, Eagle Lake, Fla. 33839 (Thelma T. Hobby, surviving spouse)

Filed July 26, 1971, Ser. No. 166,036

Int. Cl. A23b *1/04*

U.S. Cl. 126—59.5 **1 Claim**



1. A grove heater apparatus comprising in combination:

a. a burning pot having bottom and side walls and adapted for burning fuel contained therein;

b. a removable hollow truncated cone base member having a plurality of apertures therein for passing of air therethrough and being adapted for said burning pot to set on;

c. an air duct means passing through the bottom of said burning pot and forming an air passage through said burning pot and being adapted for the passage of air therethrough from an opening in said bottom wall through said air duct, said air duct being tapered from a larger passageway at the bottom of said burning pot to a smaller passageway at the top portion of said burning pot whereby an improved draft is obtained;

d. after burner means attached to said air duct for directing air passing through said duct into rising gases from said burner pot, said after burner having a hollow cylindrical member having a plurality of openings therein at predetermined locations and having a cap covering one end thereof;

e. a stack having a removable, cover, said stack covering said after burner means and being attached on said burner pot; and

f. soot remover means for removing soot from said after burner, said soot remover means including a plurality of member encircling said after burner means and having a handle attached thereto and extending through an opening in the side of said stack for moving said encircling members along the surface of said after burner without removing the stack means from said heater apparatus.

3,868,945

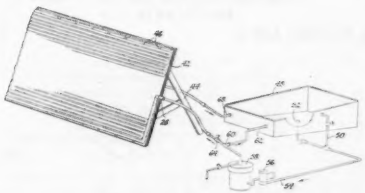
SOLAR HEATER FOR SWIMMING POOLS

Edward J. Konopka, Royal Oak, and Conan F. Fisher, Jr., Algonac, both of Mich., assignors to Fun and Frolic Incorporated, Madison Heights, Mich.

Filed Mar. 10, 1972, Ser. No. 233,518

Int. Cl. F24j *3/02*

U.S. Cl. 126—271 **10 Claims**



1. A heat exchanger for water consisting of a pair of sheets of plastic film of substantially identical configuration abutting one another with their edges sealed together and lines intermediate the edges sealed together so as to form a single continuous sinuous flow path formed of a plurality of straight line sections between a pair of end connectors which pass through the edges; and a plurality of sections wherein the pair of sheets are sealed together formed along such straight line sections and portions extending into the straight sections so as to interrupt laminar flow to create turbulence in the flow along the straight line sections and thereby enhance the heat transfer efficiency of the exchanger.

3,868,946

MEDICAL ELECTRODE

James S. Hurley, 120 Merwins Ln., Fairfield, Conn. 06430

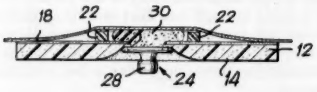
Filed July 13, 1973, Ser. No. 379,056

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.1 E **7 Claims**

1. A medical electrode comprising a non-porous soft sheet of material having top and bottom surfaces and being adapted to be placed on the skin, an electrical conductor member embedded with said sheet of material and having a flange portion forming the bottom of a well, a recess formed between

said bottom surface of said sheet of material and said flange forming a portion of the walls of said well and a non-porous wall member attached to and depending from said bottom surface, said wall member encircling said recess to form a barrier and form the remainder of the wall portion of said well, said electrical conductor member having a male electrical connector member projecting outwardly from the top surface of said sheet, a compressible sponge member saturated with



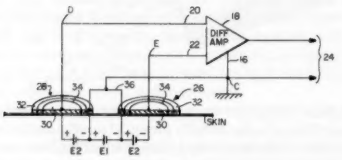
an electrically conductive liquid located within said well and having a thickness greater than the depth of said well, said sponge member being in contact with said flange, said sheet of material having a self-stick adhesive on said bottom surface, and release paper means covering said bottom surface and compressing said sponge member totally in said well when said electrode is being stored prior to utilization, said well serving to form a barrier and contain said liquid to prevent said liquid from leaking when said electrode is stored.

3,868,947

CONCENTRIC ELECTRODE CONSTRUCTION FOR AN ELECTROCARDIOGRAM TRANSMITTER

William P. Holsinger, Herndon, Va., assignor to The United States of America as represented by the Secretary for Department of Health, Education, and Welfare, Washington, D.C.

Filed Oct. 16, 1973, Ser. No. 406,870
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 E **2 Claims**



1. An electrode assembly for generating electrocardiogram bioelectric potential signals suitable for wave-form analysis, said assembly comprising: two separate transmitter electrodes adapted to be placed on a subject's skin in electrical contact therewith, each electrode comprising a flat exposed disc which includes an electrically conductive central disc member and an outer conducting ring disposed in surrounding relationship about the periphery of said central conductive member, said outer conducting ring being spaced from said central conductive member by an intermediate insulating annulus, said central conductive member, said outer conducting ring, and said insulating annulus being coplanar and concentrically disposed; means for electrically coupling said outer conducting rings of each said electrode in common and to a common ground of a differential amplifier; and means for electrically connecting said central conductive member of each said electrode to a different respective input of the differential amplifier, whereby a signal representative of the bioelectric potential is produced at the differential amplifier output.

3,868,948

MULTIPLE CHANNEL ELECTROCARDIOGRAPH

Ernest F. J. Graetz, Derry, N.H., assignor to Parke, Davis & Company, Detroit, Mich.

Continuation of Ser. No. 281,074, Aug. 16, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 448,173
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 G **9 Claims**

1. In an electrocardiograph comprising a plurality of parallel signal processing channels, each one of said channels including means for amplifying signals, means for simultaneously applying a plurality of signals representative of different body electrical potentials including electrical potentials in the vicinity of the heart to said channels, and means for simultaneously recording signals processed by said channels, the combination comprising:

means for automatically changing said applying means to sequentially apply different pluralities of body electrical potential signals to said channels, at least one of said different pluralities of body electrical potential signals being chest signals representative of electrical potentials in the vicinity of the heart, and

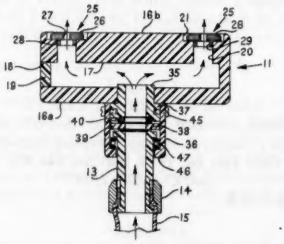
means in each one of said channels responsive to said changing means for reducing the amplitudes of the chest signals.

3,868,949

HYDROMASSAGE DEVICE

Howard M. Arneson, San Rafael, Calif., assignor to Arneson Products Inc., San Rafael, Calif.

Filed Aug. 8, 1973, Ser. No. 386,699
Int. Cl. A61h 9/00
U.S. Cl. 128—66 **4 Claims**



1. A hydromassage device comprising a body member having an upper face, a lower face and a centrally located inlet on its lower face, means for connecting the body member by way of its inlet to a source of water under pressure, such means allowing free rotation of the body member, at least one jet nozzle on the upper face of the body member, said jet nozzle being substantially in or below the plane of said upper face and means for rotating the body member while water is issuing from the jet nozzle.

3,868,950

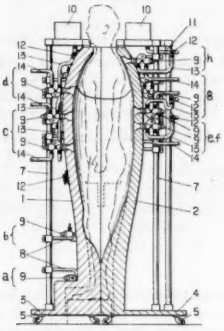
BODY TREATING APPARATUS

Yoshio Kato, 31, Nishinagasuhondori, Amagasaki, Japan

Continuation-in-part of Ser. No. 183,116, Sept. 23, 1971, abandoned. This application Nov. 8, 1973, Ser. No. 413,807
Claims priority, application Japan, Sept. 24, 1970, 45-83974
Int. Cl. A61h 9/00
U.S. Cl. 128—66 **10 Claims**

1. A body treating apparatus for massaging, bathing, cleaning, hydrokinetic procedures, and the application of solutions or substances, comprising: a casing member shaped to enclose at least parts of a person's body; at least one container for storing a solution; a plurality of nozzle assemblies for discharging the solution, provided in said casing member at designated

areas of the person's body when positioned in said casing; fluid ducts to convey the solution from said container to said nozzle assemblies; and compressed-gas ducts linked to said nozzle assemblies for expelling the solution therefrom, whereby the



latter is vigorously sprayed against the designated areas of the person's body; wherein said nozzle assemblies include each a discharge head, a member for regulating the amount of the solution being discharged, and at least one distribution chamber linked to one of said fluid and said gas ducts.

3,868,951

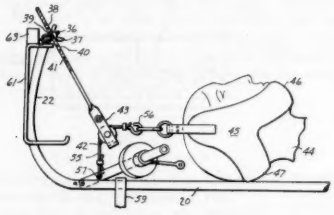
TRACTION DEVICE

Donald Albrecht, P.O. Box 1406, 831 Second St., Santa Monica, Calif. 90406

Filed Sept. 7, 1973, Ser. No. 395,161

Int. Cl. A61h *1/02*

U.S. Cl. 128—75 **23 Claims**



1. A physical traction apparatus for applying linear force through harness means to a portion of an anatomy which comprises:

a. a frame;

b. a lever arm member, said lever arm member pivotally mounted on said frame;

c. pulley means, said pulley means rotationally mounted to said frame;

d. cable means, said cable means engaged with said pulley means, one end of said cable means fixed to said lever arm member; and

e. weight means, said weight means adjustably mounted on said lever arm member, said cable means adapted to transmit force generated by said lever arm member and said weight means to said harness means.

3,868,952

INFLATABLE SHAPED STRUCTURES

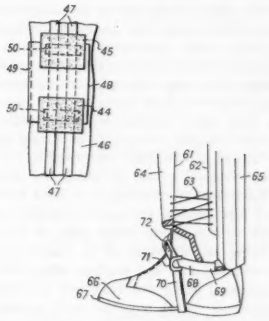
Gildas Hatton, Paris, France, assignor to Aerazur Constructions Aeronautiques, Paris, France

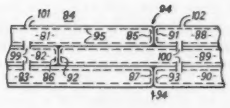
Continuation-in-part of Ser. No. 267,162, June 28, 1972, Pat. No. 3,823,711. This application Apr. 15, 1974, Ser. No. 460,917

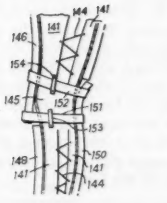
Claims priority, application France, Apr. 17, 1973, 73.14078; Apr. 17, 1973, 73.14079; Feb. 19, 1974, 74.05658; Feb. 19, 1974, 74.05659

Int. Cl. A61f *5/02*

U.S. Cl. 128—78 **13 Claims**







1. An orthopaedic device comprising, in combination, (i) an inflatable structure having at least two elongated fabric pipes of substantially square cross-section disposed in parallel relationship, each pipe including opposed plane side walls and having a base constituted by a portion of a sheet of air-permeable fabric to which said side walls are secured along their one longitudinal edge, the adjacent respective side walls of each adjacent pair of pipes being secured together substantially along their other longitudinal edge, and an inflatable tube of gas-tight resilient material in each said pipe, and (ii) at least one removable cushion secured on a face of said

structure and at right angles thereto for presenting towards an emaciation of the leg.

4. An orthopaedic device comprising in combination, (i) an inflatable structure having at least two elongated fabric pipes of substantially square cross-section disposed in parallel relationship, each pipe including opposed plane side walls and having a base constituted by a portion of a sheet of air-permeable fabric to which said side walls are secured along their one longitudinal edge, the adjacent respective side walls of each adjacent pair of pipes being secured together substantially along their other longitudinal edge, and an inflatable tube of gas-tight resilient material in each said pipe, and (ii) a boot, and means for connection between a lower part of said structure and said boot to maintain the sole of said boot in a direction substantially at right angles thereto, whereby when the device is fitted to the leg the boot is maintained substantially at right angles to the tibia and opposes transverse rocking of the ankle.

6. An inflatable structure having at least two elongated fabric pipes of substantially square cross-section disposed in parallel relationship, each pipe including opposed plane side walls and having a base constituted by a portion of a sheet of air-permeable fabric to which said side walls are secured along their one longitudinal edge, the adjacent respective side walls of each adjacent pair of pipes being secured together substantially along their other longitudinal edge, and an inflatable tube of gas-tight resilient material in each said pipe, the pipes having at least one discontinuity disposed in the vicinity of a zone of articulation of a limb on which the structure is provided, said discontinuity resulting in at least two distinct sub-assemblies of pipes which are each inflatable and deflatable independently of the other, each pipe of one of the sub-assemblies being an extension of an associated pipe of the other sub-assembly, and the portion where two associated pipes are separated being, for each pair of associated pipes, offset longitudinally of the structure with respect to the position of separation of each alternate pair of associated pipes.

10. An inflatable structure having at least two elongated fabric pipes of substantially square cross-section disposed in parallel relationship, each pipe including opposed plane side walls and having a base constituted by a portion of a sheet of air-permeable fabric to which said side walls are secured along their one longitudinal edge, the adjacent respective side walls of each adjacent pair of pipes being secured together substantially along their other longitudinal edge, and an inflatable tube of gas-tight resilient material in each said pipe, there being provided on the fabric adapted to surround the limb on which the structure is secured, about the zone of articulation of the limb, a first section of said structure for disposing on that side of said zone on which the limb is attached to the body, a second section extending the first section towards the extremity of the limb, inside the zone of articulation a third section disposed on that side of the zone on which the limb is attached to the body, a fourth section disposed as an extension of the third section and positioned towards the extremity of the limb, the first section overlapping the zone of articulation of the limb and the fourth section extending beyond the zone of articulation and not being stitched at its upper part, means being provided to enable the ends of the first and fourth sections to be secured together and released at each side of zone of articulation of the limb.

3,868,953

VALVE SEAT RING FOR THE FASTENING IN CYLINDER HEADS OF INTERNAL COMBUSTION ENGINES

Walter Roll, Jesingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

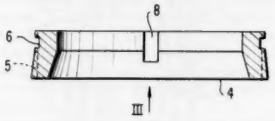
Filed Dec. 22, 1972, Ser. No. 317,780

Claims priority, application Germany, Dec. 23, 1971, 2164357

Int. Cl. F01l *3/22*

U.S. Cl. 123—188 S **15 Claims**

1. A valve seat ring for fastening in cylinder heads of internal combustion engines, characterized by the arrangement of a self-cutting thread at the valve seat ring, the self-cutting thread includes at least one cutting edge which extends in the axial direction of the valve seat ring.



6. A valve seat ring for fastening in cylinder heads of internal combustion engines, characterized by the arrangement of a self-cutting thread at the valve seat ring, and in that a groove for shavings is provided in the valve seat ring, which extends in the circumferential direction.

3,868,954

HEMADYNAMOMETER MICROPHONE

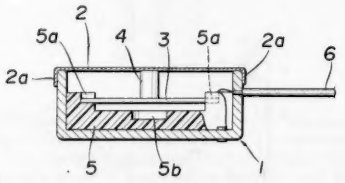
Kazuo Ueda, Tokyo, Japan, assignor to Ueda Works Co., Ltd., Tokyo, Japan

Filed June 5, 1973, Ser. No. 367,117

Claims priority, application Japan, Feb. 10, 1973, 48-017769

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 S **4 Claims**



1. A hemadynamometer microphone comprising:

a. a housing;

b. a support member in said housing, said support member being made of an elastic material and being constituted by a centrally recessed elongate body made of a single part and first and second longitudinal grooves symmetrically formed near the ends of said body in upwardly and inwardly opening fashion, said body having such a configuration as to permit the support member to be snugly and integrally fitted in the inner periphery of said housing;

c. a ceramic element positioned in and centrally of the housing, with the opposite ends thereof fitted in said first and second grooves and a substantially major central part thereof held in spaced relation from said support member, for serving to convert sounds into electrical oscillations;

d. an oscillating diaphragm means mounted over said housing; and

e. a relay member made of an elastic material disposed centrally of the ceramic element, between and interconnecting said ceramic element and said diaphragm, for transmitting the oscillation of said diaphragm to said ceramic element.

3,868,955

ALDEHYDE POLYSACCHARIDE DRESSINGS

Fred Harold Steiger, East Brunswick, and Judith Ann Siragusa, Hopewell, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Oct. 5, 1973, Ser. No. 403,749

Int. Cl. A61f *13/00, 13/18*

U.S. Cl. 128—296 **16 Claims**

1. In a product for absorbing body fluids comprising an absorbent body and having deodorizing properties, the improvement wherein said product comprises aldehyde polysaccharide having amine deodorizing properties.

3,868,956

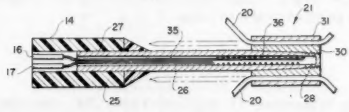
VESSEL IMPLANTABLE APPLIANCE AND METHOD OF IMPLANTING IT

Ralph J. Alfidi, 742 Coy Ln., Chagrin Falls, Ohio 44022, and William B. Cross, 746 Ecton Rd., Akron, Ohio 44303

Filed June 5, 1972, Ser. No. 259,463

Int. Cl. A61m *29/00*; **A61b** *17/00*

U.S. Cl. 128—345 **38 Claims**



1. An appliance for implanting within a vessel of an animal body, said appliance comprising a structure formed from a recovery material, compatible with living body tissue, said structure having a predetermined initial configuration which said structure tends to assume upon the controlled application of a stimulus to said structure, and said structure being deformable to a second configuration suitable for facilitating implanting, in a vessel in an animal body, whereby said controlled application of said stimulus to a said appliance, when implanted, will cause said appliance to assume a configuration within said vessel which configuration is substantially similar to said initial configuration.

3,868,957

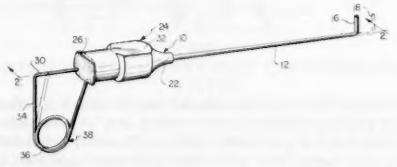
VASCULAR CLAMP

Harold W. Doddington, Gainesville, Fla., assignor to Board of Regents, State of Florida, Tallahassee, Fla.

Filed Oct. 3, 1973, Ser. No. 403,023

Int. Cl. A61b *17/12*

U.S. Cl. 128—346 **9 Claims**



1. A clamping implement, especially suitable for use as a vascular or hemostatic clamp, comprising a tubular shaft having open opposing end portions, one of said end portions defining a fixed clamping jaw angularly related to and extending from the shaft and a hand piece supportively engaging the other end portion, an elongated member slidably housed in the shaft and having opposing end portions, one of said end portions defining a movable clamping jaw and being angularly related to and extending from the member and being disposed in confronting complementary clamping relation with the clamping jaw on the shaft, said other end portion of the member being slidably received by the hand piece and extending therethrough and therebeyond and means structurally associated with said extending portion of the member to continuously urge the movable clamping jaw into claimping relation with the fixed clamping jaw.

3,868,958

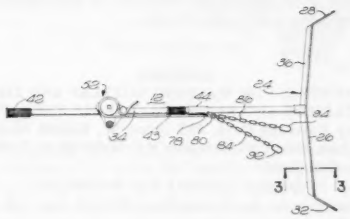
CALF EXTRACTION MECHANISM

Raymond E. Rarick, Mission Viejo, Calif., assignor to Inno-vet Instruments, Inc., Mill Valley, Calif.

Filed Nov. 26, 1973, Ser. No. 419,155

Int. Cl. A61d *01/08*

U.S. Cl. 128—352 **5 Claims**



1. A calf extraction mechanism comprising a combination:
a bracing member of generally U-shaped configuration and defined by a base having an arm extending from opposite ends of said base in a first direction, said bracing member being of generally planar cross-sectional configuration;
a support rod having a first end extending from the center of the bracing member at a right angle at the junction thereof and in a second direction generally opposite from said first direction to a second free end;
a winch secured to said support rod intermediate said support rod ends including pivotal means, a drum and an idler roller;
gripping surfaces positioned on said support rod on opposite sides of said winch member;
means for applying rotary forces to revolve said drum and simultaneously varying the spacing between said idler roller and said drum;
a rope slidably movable between said idler roller and said drum and removable from said winch when said rotary forces are removed from said drum; and
a chain member secured to one end of said rope.

3,868,959

HAIR SUPPORTING ELEMENT FOR A WEFTLESS OR REGULAR WIG

Hyung Chan Koh, 605-21, Soo U-Dong, Seong Buk-ku, Seoul, South Korea

Filed Oct. 2, 1972, Ser. No. 293,803

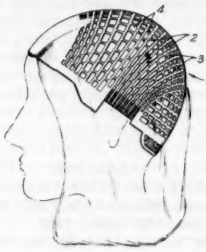
Claims priority, application South Korea, Aug. 19, 1972, 5171/72; Oct. 2, 1971, 5136/71

Int. Cl. A41g *3/00*

U.S. Cl. 132—53 **1 Claim**

1. A wig comprising a plurality of elongated supports, bridges connecting the supports in spaced relation, and hairs implanted in said supports at regularly and longitudinally spaced positions along each of the supports and such that pluralities of hairs extend from respectively from said regularly spaced positions and are separated by bare expanses on

annular diaphragm, said relief valve seat being situated coaxially and radially outwardly of said non-return valve seat; an annular portion of said first annular diaphragm situated co-



said supports, said supports being stretchable independently of the implantation of said hairs whereby said wig is adapted to stretch in the longitudinal direction of said supports, the supports being in the form of tubes.

3,868,960

MACHINES FOR WASHING BOTTLES AND LIKE CONTAINERS AND REMOVING LABELS THEREFROM

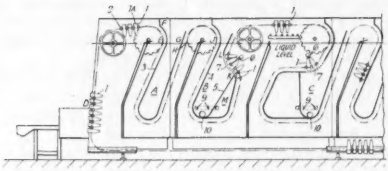
Anthony Raymond Cove, 413 Baker St., Enfield Middlesex, and Jack Tween, 26 Crutchley Rd., Wokingham, Berkshire, both of England

Filed Sept. 13, 1973, Ser. No. 288,554

Claims priority, application Great Britain, Sept. 16, 1971, 43335/71

Int. Cl. B08b *3/02, 9/08*

U.S. Cl. 134—73 **4 Claims**



1. An apparatus for washing bottles and removing labels therefrom, comprising:

a washing tank for containing a cleaning fluid;

a conveyor for conveying bottles into and through said tank; a plurality of bottle pockets open at both ends mounted to said conveyor for holding said bottles while being conveyed through said washing tank, said pockets being arranged in a plurality of substantially aligned rows across at least a portion of the width of said conveyor;

means for retaining said bottles in said pockets while being conveyed through said washing tank;

nozzle means located in said washing tank adjacent said conveyor for expelling jets of fluid into and through said bottle pockets being conveyed past said nozzle means; and

means for bringing the neck portions of said bottle pockets, and bottles contained therein, in adjacent rows into close proximity with each other, and for correspondingly diverging the bottom portions of said adjacent bottle pockets and therein contained bottles, in the path of said fluid jets being expelled from said nozzle means, including a bottle guide mounted in said tank and having an arcuate portion for guiding bottles held in said pockets through an arcuate path, the center of curvature of said arcuate portion being substantially coincident with the location of said nozzle means.

3,868,961

EXTENSIBLE SUPPORT ELEMENT FOR PROTECTION CANVAS

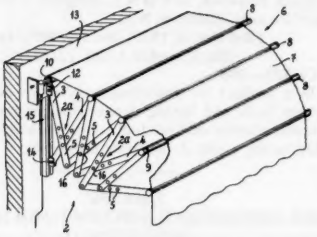
Pierre Sternis, 17, Avenue Paul Vailland Couturier, 94 Vitry-sur-Seine, France

Filed Oct. 9, 1970, Ser. No. 79,426

Claims priority, application France, Nov. 6, 1969, 69.38620

Int. Cl. A45f *1/16;* **E04f** *10/06*

U.S. Cl. 135—4 R **8 Claims**



1. Extensible support element for protection canvas, of the type comprising a plurality of pivotally interconnected toggle links, each pair of toggle links having a common pivot means, the common pivot means of the two links of each of the toggles being shiftable by a same value and in the same direction along the length of said links in relation to the longitudinal middle point of said two links.

3,868,962

BACK FLOW PREVENTOR

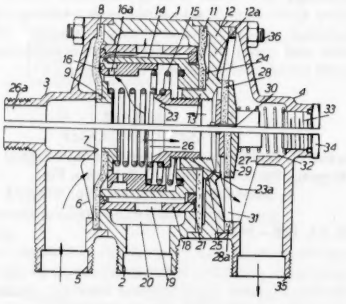
William Waterston, 73 Kaikorai Valley Rd., Dunedin, New Zealand

Filed May 29, 1973, Ser. No. 364,242

Claims priority, application New Zealand, May 26, 1972, 167291/72

Int. Cl. F16k *45/00*

U.S. Cl. 137—218 **5 Claims**



1. A back flow preventor which comprises a casing defining a fluid chamber therein; means defining an inlet to said chamber; means defining an outlet from said chamber; means defining a relief outlet from said chamber between said inlet and said outlet; means defining a relief chamber in communication with atmospheric pressure, a first annular diaphragm mounted in said chamber between said inlet and said relief outlet; means defining an annular non-return valve seat on the upstream side of said first annular diaphragm; means defining an annular relief valve seat on the downstream side of said first

axially and radially outwardly of said relief valve seat being in communication on its downstream face with said relief chamber; a thrust member provided within said relief chamber being in contact with an annular portion of said first annular diaphragm radially outwardly of said relief valve seat, the arrangement being such that said annular portion of the first annular diaphragm radially outwardly of the relief valve seat, upon which there acts a difference in pressure between a fluid pressure from said inlet and the atmospheric pressure, is supported by said thrust member, which thrust member is arranged to transmit the downstream fluid pressure to said annular portion to counter-balance this difference in pressure.

3,868,963

APPARATUS FOR MONITORING THE FILLING FACTOR OF CONTAINERS FOR COMPRESSED GAS

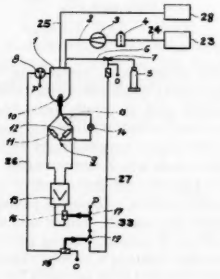
Reiner Muellerpoths, Schwetzinger, Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 11, 1973, Ser. No. 359,424

Claims priority, application Germany, May 31, 1972, 2226528

Int. Cl. F16k *49/00*

U.S. Cl. 137—340 **7 Claims**



1. A gas supply plant particularly for use in supplying an insulating gaseous medium such as SF_6 to a switching installation insulated with the gas comprising a storage container receiving the gas in a pressurized state from a compressor drawing gas from the low pressure side of the switching installation and adapted to deliver the gas to the high pressure side of the switching installation, a heated ancillary pressurized gas container connected to said storage container by a pipe line including a control valve therein, a pressure gauge connected with said storage container for monitoring the gas pressure therein and which delivers a first control signal when the gas pressure falls to a predetermined level, a state measuring member located at the lowest part of said storage container and which is responsive to changes in the physical state of the medium therein from its gaseous state to its liquid state to produce a corresponding second control signal, and control means actuated by said first and second control signals acting conjointly to control the opening and closing operations of said control valve in said pipe line interconnecting said ancillary container to said storage container.

3,868,964

CONVEYER FOR SLURRY HOSE TRANSPORTATION SYSTEM

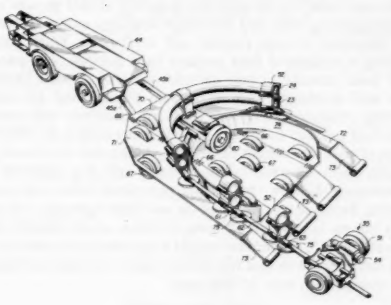
James H. Tarter, Royal Oak; Ronald G. Read, Birmingham; Valentino Colussi, Walled Lake, all of Mich., and David L. McCain, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 297,113, Oct. 12, 1972, abandoned. This application Aug. 21, 1973, Ser. No. 389,271

Int. Cl. H02g *11/00;* **B65g** *53/30*

U.S. Cl. 137—344 **6 Claims**

1. In a system for transporting a slurry from a mining machine in a mine having a floor, and which includes at least one flexible hose supported by a plurality of wheeled carts spaced along the length of the hose and links pivotally interconnected with one another and the carts for pivotal movement in a horizontal plane, and wherein the hose is required to be transferred in a 180° bend between a storage section and a parallelly located active section as the need for the hose changes, the improvement comprising:



a conveyer movably supporting the hose, carts and links off of the mine floor in the 180° bend portion of the hose, and means attached to the conveyer for moving the conveyer along the mine floor parallel to the storage section of the hose as the hose is being transferred between the active and storage sections.

3,868,965

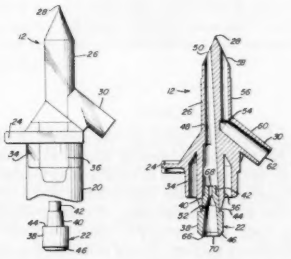
DROP FORMER FOR INTRAVENOUS SET

Douglas G. Noiles, New Canaan, and Anthony D. Spasiano, Greenwich, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.

Filed July 3, 1973, Ser. No. 376,227

Int. Cl. A61m *5/16*

U.S. Cl. 137—559 **22 Claims**



1. A drop former for use with a drip chamber for determining the flow rate of a parenteral fluid, comprising:, body means defining a parenteral fluid passage therethrough, said parenteral fluid passage having an inlet opening for communicating with a source of parenteral fluid and an outlet opening for communicating with a drip chamber, said parenteral fluid passage defining a drop forming orifice for forming about 12 to 20 drops of parenteral fluid for each millimeter of fluid flowing therethrough at the pressures encountered in intravenous feeding, said outlet opening being at least as large as said inlet opening, and said body means being formed from a plastic which absorbs less than about 0.03 percent by weight water measured over about a twenty-four hour period so that

the size of said drops will not materially change with time or flow rate.

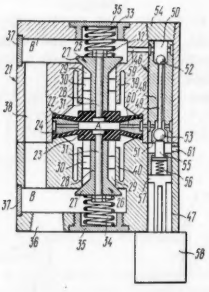
12. A piercer and flow meter for an intravenous set, comprising: a piercer having a base and a piercing member with a sharp end for piercing the closure of a parenteral fluid container, said piercer defining a parenteral fluid passage for transferring parenteral fluid from said container, said parenteral fluid passage having an opening in said piercing member for communicating with said container and a discharge opening in said base; a drip chamber attached to said piercer and communicating with said discharge opening; and a drop former attached to said piercer and comprising body means defining a parenteral fluid passage therethrough, said parenteral fluid passage having an inlet opening communicating with said discharge opening in said piercer and an outlet opening communicating with said drip chamber, said parenteral fluid passage defining a drop forming orifice for forming drops of parenteral fluid of predetermined size which can be visually observed while falling through said drip chamber for determining the flow rate of said parenteral fluid, said outlet opening being at least as large as said inlet opening, and said body means being formed from a plastic which absorbs less than about 0.03 percent by weight water measured over about a 24 hour period so that the size of said drops will not materially change with time of flow rate.

3,868,966

ELECTROPNEUMATIC VALVE

Petr Vasilievich Malygin, prospekt Ilicha, 22, kv. 45; Valentin Mikhailovich Kochetkov, ulitsa Snezhnaya, 19, kv. 14, and Alexei Efimovich Tolkachev, ulitsa Leskova, 10, kv. 59, all of Gorky, U.S.S.R.

Filed June 13, 1974, Ser. No. 479,265
Int. Cl. F15b *13/07*
U.S. Cl. 137—596.16 **2 Claims**



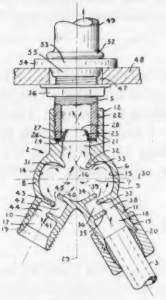
1. An electropneumatic valve for the control of motions of an actuating mechanism comprising: a body with channels for the delivery of compressed gas to an actuating mechanism and discharge of used gas into the atmosphere, and a space in its central part; two elastic diaphragms arranged parallel to each other in said body and forming a space between them; a spring-loaded closing element rigidly connected to one of said diaphragms and intended to shut off the channel for the delivery of compressed gas in said body; a servo-actuated valve intended to control said closing element; said servo-actuated valve with a space inside which is in constant communication with the channel in said body for the delivery of compressed gas and is periodically put in communication with the space between said diaphragms; channels for the delivery of compressed gas and a channel for the discharge of the used gas into the atmosphere, each of said channels provided with a branch for the delivery of compressed gas to, and its discharge from, another actuating mechanism; a second spring-loaded closing element installed in the branch of said channel for the delivery of compressed gas and rigidly connected with the other of said diaphragms; said spring-loaded closing elements with springs whose stiffness is different to ensure successive opening of said closing elements.

3,868,967

ADAPTER FOR MIXING FLUIDS

Donald D. Harding, Lagro, Ind., assignor to Kenneth W. Shropshire, Fort Wayne, Ind.

Filed Feb. 16, 1973, Ser. No. 333,191
Int. Cl. F16k *19/00*
U.S. Cl. 137—604 **3 Claims**



1. A device for mixing fluids comprising: a body having a central chamber having inner curved end surfaces, said body also being provided with an axialiy extending outlet passage having an inner end communicating with said chamber and with a pair of converging longitudinally extending inlet passages having inner ends which communicate with said chamber, said body adjacent said inner end of said outlet being provided with baffle means, said pair of passages having longitudinal axes which intersect the axis of said outlet passage, at least one of said inlet passages being provided with baffle means whereby when fluids of a different character are forced into said chamber via said inlet passages for mixing and flow out said outlet passage, said baffle means may assist in preventing back flow of the mixture into said one inlet passage, said last-mentioned baffle means comprising a pair of axially spaced abutments extending transversely in one direction to form a secondary chamber and a third abutment which extends transversely toward said secondary chamber to form an inlet port at the supply end of said one inlet passage and an outlet port to said central chamber for directing at least some of the fluid against one of said curved end surfaces toward said baffle means adjacent said outlet passage whereby to assist in the temporary retention of fluid in said central chamber prior to its flow through said outlet passage.

3,868,968

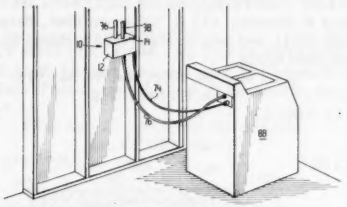
FLUID CONTROL MECHANISM FOR APPLIANCES

Manfred E. Fuhrmann, 24 Walnut St., White Plains, N.Y. 10607

Filed Aug. 17, 1973, Ser. No. 389,169
Int. Cl. B08b *3/00*
U.S. Cl. 137—624.18 **7 Claims**

1. A fluid control mechanism for selectively controlling the flow of a fluid from a supply pipe to a remotely located appliance using said fluid, said fluid control mechanism comprising in combination a supply pipe with only one exit port, an electrically actuatable valve assembly having an inlet port and an exit port, said inlet port of said electrically actuatable valve assembly being connected to said exit port of said supply pipe, said exit port of said electrically actuatable valve assembly being coupled to a pipe fitting which permits the detachable connection of said exit port of said valve assembly at a point in said appliance where a single conduit supplies the appliance with all of the fluid used therein and there are no controllable valves within said appliance which control the flow of fluid to said appliance, said electrically actuatable valve assembly

comprising an electrically activated valve mounted within said electrically actuatable valve assembly for selectively controlling the flow of fluid from said inlet ports to said exit port of said electrically actuatable valve assembly, said electrically



operated valve having control terminals adapted to be coupled to control terminals of a timer for said remotely located appliance which produce electrical control signals to selectively operate said valve.

3,868,969

MULTIWAY VALVE

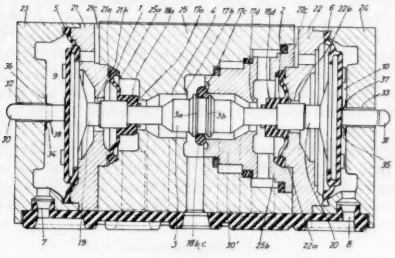
Willi Schwenk, Fuchshofstr. 28, Ludwigsburg, Germany

Filed Mar. 1, 1973, Ser. No. 336,943

Claims priority, application Germany, Mar. 1, 1972, 7207693

Int. Cl. F16k *11/02, 31/165*

U.S. Cl. 137—625.5 **1 Claim**



1. A multiway valve comprising a housing having a bore therein, a plurality of passages connected to the bore and to the outside of the housing, and a plurality of valve seats located between the openings of the passages into the bore, a valve member comprising an elongated spindle, means mounting said spindle for movement within the bore longitudinally thereof, said spindle having a plurality of seal means in the form of annular members each having a sealing surface engagable with each of the valve seats spaced therealong, said mounting means including means mounting the spindle to float in the bore out of frictional contact with the walls thereof and including support diaphragms adjacent each end of the spindle having their outer edges secured to the housing and supporting the spindle and closing the ends of the bore, control diaphragms spaced from and on the sides of the support diaphragms away from the bore, central pushrods carried by the control diaphragms coaxial with the spindle for actuating it, said end walls and said support diaphragms between them forming chambers at each end of the housing, and means to conduct pressure fluid to such chambers, said valve having *n* paths therethrough with "*n*–**1**" valve seats and "*n*–**2**" seal means, one of the diaphragms at each end of the casing being of the snap-action type, said housing having openings therein in the end walls facing said control diaphragms, actuating push rods slidable in said openings and extending outwardly of the end walls secured to the control diaphragms for manual movement thereof, and means for venting fluid from the spaces between the support diaphragms and the control diaphragms.

3,868,970

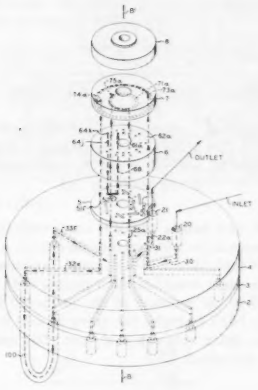
MULTIPOSITIONAL SELECTOR VALVE

Buell O. Ayers, and Lewis B. Roof, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 4, 1973, Ser. No. 366,728

Int. Cl. F16k *3/08, 11/02*

U.S. Cl. 137—625.46 **10 Claims**



1. An apparatus comprising:

a. an inlet;

b. a movably-positionable distributor comprising a first circular grooved channel in a rotatable plate, said first circular grooved channel in direct contact with a channel from said inlet, said first circular grooved channel having a second channel extending therefrom whereby by rotation of said plate registry can be maintained with any one of a plurality of openings located at the same direction in the same direction away from this first circular grooved channel;

c. a first plurality of openings, each of said openings connected to a conduit leading from said distributor; and

d. a first plurality of conduits each connected to one of said openings.

3,868,971

FUEL METERING DEVICE ESPECIALLY FOR THE COMBUSTION CHAMBER OF AN AEROJET ENGINE

Wilhelm Grunert, Dammarie-Les-Lys, and Jean Paul Francois Gilbert Briotet, Le Mee-sur-Seine, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Apr. 17, 1973, Ser. No. 352,003

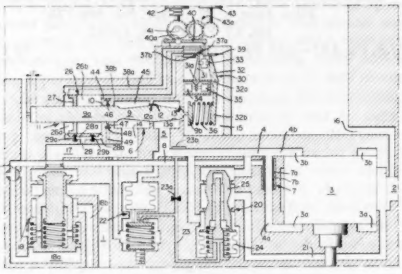
Claims priority, application France, Apr. 18, 1972, 72.13605

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.48 **5 Claims**

1. In a flow metering device for fuel containing or liable to contain solid impurities which comprises inlet and outlet chambers (**5**,**45**) connected by a regulating port (**12**), feed intake means (**3**,**3***a*,**3***b*,**4**) for supplying under pressure said fuel to said inlet chamber for passage through said port into said outlet chamber, fuel outlet means (**17**,**1**) for delivering said fuel from said outlet chamber, a flow metering needle (**9**) movable axially through said regulating port (**12**) to vary the cross-sectional area of said port and thus the rate of fuel flow therethrough, a partition (**44**) at one side of said inlet and

outlet chambers and having a bore (**10**) therein coaxial with said needle, an integral extension (**9***a*) on said needle (**9**) slidably fitted in said partition bore (**10**) for axial movement therein, and control means (**11**) operatively associated with said needle extension to move the same axially in said partition bore, the improvement comprising an annular groove (46) formed in the surface of the bore (**10**) intermediate the



ends thereof, and means (**7,8,49**) communicating with said fuel intake means for withdrawing therefrom a small secondary flow of fuel, filtering said small secondary flow, and delivering the same to said annular groove (**46**) under a pressure higher than the pressure of the unfiltered fuel acting on said partition (**44**) whereby the entry of said impurities into the clearance space between said bore (**10**) and said needle extension is prevented.

3,868,972

HYDRAULIC PRESSURE COMPENSATOR

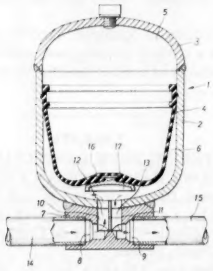
Wilhelm Zirps, Hemmingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 27, 1973, Ser. No. 401,501

Claims priority, application Germany, Nov. 4, 1972, 2254032

Int. Cl. F16l *55/00*

U.S. Cl. 138—30 **7 Claims**



1. In a hydraulic system, a combination comprising a hydraulic conduit for the flow of hydraulic fluid; a pressure vessel having a chamber provided with an opening; a flexible partition wall subdividing said chamber into a first compartment communicating with said opening, and a second compartment containing a body of gas under pressure so that said partition wall is normally flexed into said first compartment and against said opening to close the same; and connecting means connecting said hydraulic conduit with said opening, said connecting means defining a first flow path for said hydraulic fluid which conducts said hydraulic fluid in its entirety through said first compartment when said flexible partition wall is out of contact with said opening, and a second bypass flow path for said hydraulic fluid which is open and bypasses said first compartment when said flexible partition wall is in contact with said opening.

3,868,973

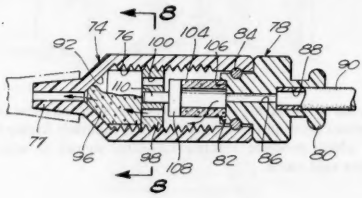
FLOW CONTROLLING OR METERING DEVICE

Howard R. Bierman, 152 N. Robertson Blvd., Beverly Hills, Calif. 90211, and John G. Mast, 7934 Kirkland Dr., Cincinnati, Ohio 45224

Filed Mar. 16, 1973, Ser. No. 341,915

Int. Cl. F15d *1/00*

U.S. Cl. 138—43 **8 Claims**



5. A flow controller for controlling a small, slow flow of liquid and having the capability of making fine adjustments in the resistance to flow comprising, in combination: a body defining a channel therethrough, a first flow resistance material having uniform flow resistance characteristics positioned within said channel so that liquid flowing therein passes through said first flow resistance material; a second flow resistance material in said body arranged and positioned in said channel for a series flow through the two resistance materials, said second resistance material having an adjustable flow resistance characteristic; and means for selectively adjusting the resistance characteristic of said second flow resistance material for selectively controlling and adjusting the flow of liquid through said flow controller, the density of said second flow resistance material being substantially less than said first flow resistance material even when adjusted to provide greatest flow resistance whereby selective adjustment of the resistance characteristic of said second resistance material operates to make a fine adjustment in the flow rate through said flow controller.

3,868,974

REINFORCED FLEXIBLE ARTICLES

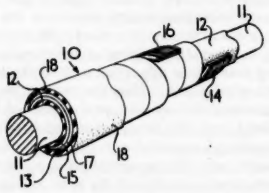
Eric Ball, Newcastle Upon Tyne, England, assignor to Dunlop Holdings Limited, London, England

Filed July 26, 1971, Ser. No. 166,021

Claims priority, application Great Britain, June 5, 1970, 27336/70

Int. Cl. F16l *11/10*

U.S. Cl. 138—129 **11 Claims**



1. A hose pipe comprising a reinforcement structure formed from at least one helically wound strip of reinforcement material, each reinforcement strip having an elongated carrier strip formed from a membrane of polymeric material, said poly-

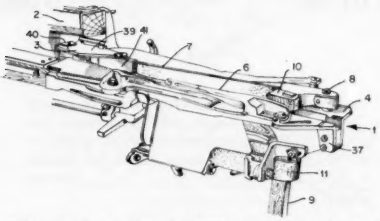
meric material having a thickness not exceeding 0.010 of an inch and an elongation at break in any direction of not more than 100 per cent, and a plurality of reinforcing filaments extending substantially parallel to the longitudinal direction of the carrier strip and applied to the surface only of said carrier strip.

3,868,975

FLY SHUTTLE LOOM AND PARTS THEREOF

Joseph E. Stahl, Easthampton, and Allen L. Cudworth, Needham, both of Mass., assignors to J. P. Stevens Co., Inc., New York, N.Y.

Filed Apr. 27, 1973, Ser. No. 354,950
Int. Cl. D03d *49/00*
U.S. Cl. 139—1 R **10 Claims**



1. In a fly shuttle loom including loom drive, lay and shuttle boxes, cams, pick ball and pick shaft, and connections to picker sticks which force the shuttle to fly from side to side, the shuttle boxes on each end of the lay comprising leather lined side plates, one of them pivoted onto the lay and the other fixed, and a box back plate above the shuttle trajectory and a lay end plate at the bottom of the box in which plate the picker stick head moves, the improvement which comprises,

a. a composite lay end plate positioned to come into contact with and guide the shuttle, the metal portion of said plate having thickness less than the full thickness and cast noncellular thermosetting elastomer lining thereon to bring up to normal thickness, and

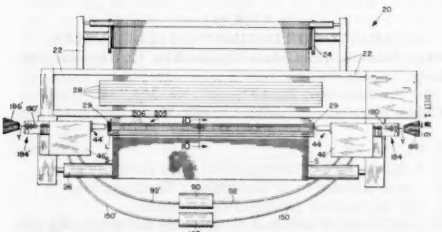
b. an elastomer lining on the side wall of the back box plate, whereby the elastomer linings reduce noise produced in the shuttle boxes and also redue transmission of vibrations to the loom structure.

3,868,976

PNEUMATIC WEFT INSERTING MECHANISM

Karl W. Wueger, North Brookfield, Mass., assignor to Crompton & Knowles Corporation, New York NY, N.Y.

Division of Ser. No. 174,687, July 24, 1972, Pat. No. 3,831,640. This application Mar. 18, 1974, Ser. No. 452,492
Int. Cl. D03d *47/24, 49/60*
U.S. Cl. 139—126 **6 Claims**



1. In a loom having a lay and means for forming a warp shed, pneumatic filling inserting mechanism for inserting a filling pick into said warp shed from an outside supply package comprising:

a. a cylindrical projectile for guiding said filling through said warp shed and having at each end thereof, an annular outer edge which lies in a plane which is at a right angle to the longitudinal axis of the projectile, and an end surface, substantial portions of which do not extend beyond said edge;

b. means for propelling said projectile through said warp shed; and

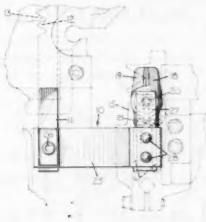
c. a plurality of spaced guides supported on said lay, each of said guides having a circular aperture of a larger diameter than said projectile and a slot extending from said aperture to the outside of the guide, said guides being arranged on said lay so that they form a guide channel for said projectile within the warp shed and wherein said projectile will be stabilized and airborne throughout its flight through the warp shed at a subsonic projectile speed of more than 90 feet per second.

3,868,977

SPRING MOUNTED REMOVABLE SCISSORS FOR LOOMS

Maurice R. Flamand, Cumberland, R.I., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1973, Ser. No. 407,009
Int. Cl. D03d *49/70*
U.S. Cl. 139—302 **3 Claims**



1. A weft cutting assembly for use on a shuttleless loom where weft yarn is drawn for a stationary source, said assembly comprising drive means connected to a source of motive power for reciprocating substantially rectilinear movement, cam means mounted on the loom, scissor means including at least one movable member mounted for operative cooperation with said cam means, and means connecting said drive means to said scissor means, said connecting means including spring-like member of substantially greater width than thickness which is attached at one end to said drive means and at the other end to said scissor means.

3,868,978

RECHARGEABLE AEROSOL-TYPE DISPENSING DEVICE FOR WHIPPED CREAM

Karl Horst Knopf, Kohlfurth 50, 565 Solingen, Germany

Filed Nov. 23, 1973, Ser. No. 418,179
Claims priority, application Austria, Nov. 22, 1972, 9958/72
Int. Cl. B65b *3/04, 31/00*
U.S. Cl. 141—19 **9 Claims**

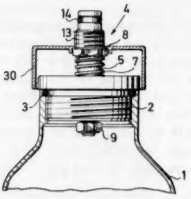
1. An aerosol-type dispensing device which is rechargeable from a conventional gas cartridge, usable, for example, as a rechargeable whipped cream dispenser, comprising in combination:

a pressure-resistant container having a refill opening;

a removable end plug sealingly closing the container opening;

a valve arranged inside the end plug, the valve having a spring-biased plunger of which a length portion protrudes from the end plug and through which a normally closed axial valve passage leads to the outside of the container, thereby permitting discharge of the container contents, when the valve is opened; and

a cartridge connecting socket which is removably attachable to the protruding portion of the valve plunger and which has a gas passageway which sealingly communicates with the axial valve passage, when the socket is



attached thereto, the socket further including means for opening its gas passageway to the inside of a gas cartridge, thereby permitting pressurized gas to flow from the cartridge into the container, when the valve is open.

3,868,979

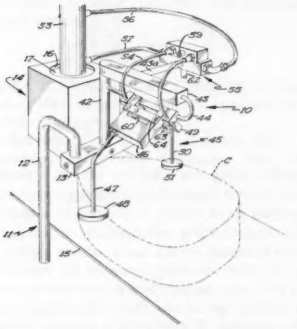
DISPENSING APPARATUS

Lyndon R. Leining, Austin, Minn., assignor to Geo. A. Hormel & Co., Austin, Minn.

Filed July 26, 1972, Ser. No. 275,323

Int. Cl. B65b *43/52*

U.S. Cl. 141—159 **10 Claims**



1. A dispensing device for dispensing flowable material into successively moving containers comprising:

a hopper adapted to contain a flowable material and having a discharge throat,

a shiftable volumetric valve in said hopper and being operable to dispense a predetermined volume of flowable material from said hopper,

a fluid pressure piston and cylinder unit connected with said volumetric valve and being operable for shifting the same,

means for conveying containers in a predetermined path of travel below the throat of the hopper,

a control mechanism including a controlling valve connected in flow controlling relation with said piston and cylinder unit and operating the same,

a pair of laterally spaced apart, elongate vertically extending sensor arms, each mounted adjacent said hopper for vertical swinging movement about a substantially horizontal axis,

operating means supported jointly by said sensor arms and operatively interrelated with said control valve, said sensor arms being shiftable in response to engagement with a moving container to actuate said operating means and to thereby operate said control valve for shifting the piston and cylinder unit and volumetric valve from a closed position to a dispensing position and to thereby permit a predetermined volume of material to be discharged through said throat into a container as each container is moved along the predetermined path of travel.

3,868,980

METHOD AND APPARATUS FOR COMMINUTING TREE STUMPS

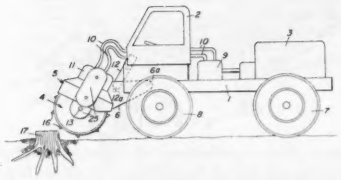
Hans Blum, Bobstadt, Germany, assignor to Hans und Heinrich Blum OHG, Hofheim/Ried, Germany

Filed Dec. 7, 1972, Ser. No. 313,067

Claims priority, application Germany, Mar. 21, 1972, 2213667

Int. Cl. B27c *9/00*

U.S. Cl. 144—2 N **13 Claims**



1. A vehicle for comminuting objects, such as tree stumps rooted in the ground, the vehicle comprising in combination, a heavy main frame having traction means mounted thereon for moving the frame over the ground surface, a carrier frame for a cutting roller extending across and adjacent to the front of the vehicle, at least one rigid swing arm fixed to the carrier frame and projecting generally normally therefrom and being pivotally mounted to the front of said vehicle frame for movement with the vehicle over the ground surface during a cutting operation and for movement in a vertical plane about a horizontal pivot axis to raise and lower the carrier frame, a large heavy cylindrical cutting roller having knives on its peripheral surface for chipping a stump upon rotating contact therewith, means suspending the cutting roller below the carrier frame for rotation about a horizontal axis relative to the carrier frame, means including a first motor for rotating said cutting roller relative to the carrier frame, means including a second motor secured to the main frame and having an output shaft connected to said carrier frame to pivot the same about said horizontal axis, and means including a third motor mounted on said frame for driving said traction means for moving the vehicle over the ground surface and for moving the cutting roller towards and away from a stump during a cutting operation.

3,868,981

APPARATUS FOR DELIMBING FELLED TREES

Georges Nadeau, 167 Golden Avenue Apt. 10, Timmins, Ontario, Canada

Filed Apr. 30, 1973, Ser. No. 355,735

Claims priority, application Canada, May 4, 1972, 141295

Int. Cl. B27c *9/00*

U.S. Cl. 144—2. Z **13 Claims**

1. Apparatus for delimbing felled trees comprising:

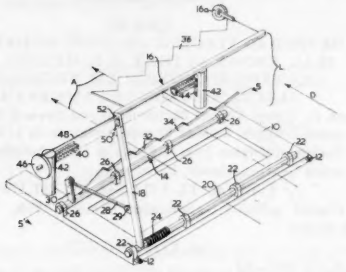
a. a base adapted to be secured in a fixed position;

b. first and second groups of cutter blades,

c. support means attached to said base for supporting said first and second groups of cutter blades therealong, said supporting means for said blades being linearly elongated in a direction transverse to the direction of travel of the trees relative thereto during operation such that the blades are capable of simultaneously engaging a plurality of generally parallel tree trunks in such manner as to

sever limbs from said trunks when the latter move longitudinally through said apparatus,

d. said means supporting said first and second groups of cutter blades being arranged to hold said first and second



groups of blades in limb severing engagement with first and second opposing sides, respectively, of said tree trunks as they are moved longitudinally through the delimbing apparatus, whereby to sever limbs from said tree trunks.

3,868,982

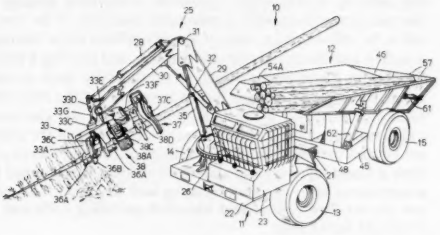
METHOD OF HARVESTING AND ACCUMULATING TREES

John Kurelek, Brantford, and Victor E. Locker, St. George, Ontario, both of Canada, assignors to Koehring Company, Milwaukee, Wis.

Division of Ser. No. 315,564, Dec. 15, 1972, Pat. No. 3,797,541. This application Aug. 23, 1973, Ser. No. 391,015

Int. Cl. A01g *23/00*

U.S. Cl. 144—309 AC **14 Claims**



1. A method for loading a log into an accumulating box comprising the steps of: providing log directing means near an end of said box, said log directing means having a portion over which a log in contact therewith can tip and down which said log can be laterally directed; supporting said log and moving it toward said box over said log directing means until the center of gravity of that portion of said log which is to be deposited in said box is past said log directing means; and releasing said log so that it rests on and pivots about said log directing means and is directed laterally downward thereby into said box by the force of gravity.

3,868,983

HAND TOOL

Dean R. Newcomb, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 7, 1973, Ser. No. 422,633

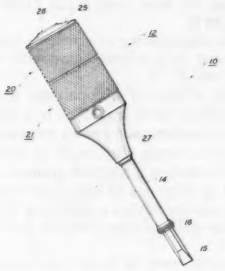
Int. Cl. B25b *15/04*; **B25g** *1/06*

U.S. Cl. 145—50 R **4 Claims**

1. Hand tool apparatus comprising

an elongated driven member adapted to receive a blade for driving a screw or the like,

segmented handle means including a plurality of drive rolls each having a passage therethrough, said passages being aligned to receive said driven member,



said drive rolls each including one way clutches to engage said driven member upon rotation in opposing directions and to disengage said driven member upon reversing the direction of the rotation thereof.

3,868,984

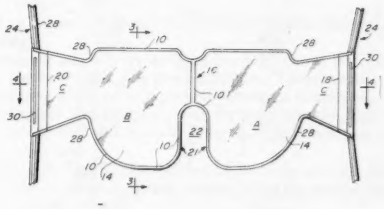
DUAL CONTAINER

Blanche I. Jorgensen, 1818C W. Norwood St., Chicago, Ill. 60660

Filed Feb. 25, 1974, Ser. No. 445,117

Int. Cl. A61f *7/00*

U.S. Cl. 150—2.3 **2 Claims**



1. A hot/cold receptacle of plastic material for use around the area of the eyes of the user and having an open area whereby no part of the receptacle touches the nose, comprising elongated upper and lower walls of preformed shape heat sealed together along the side edges of said walls, said walls being heat sealed together transversely to the long axis of said receptacle and medially of its ends to form a pair of separate end-to-end compartments, said upper wall being shorter in length than the length of the lower wall and the ends of said shorter wall extending inwardly of the ends of the longer wall whereby to form a filler opening in each end, a neck portion on the free ends of said receptacle, the side edges of said neck portions tapered inwardly towards said respective compartments, and an elongated tie strip secured medially to the free ends of said lower wall, with the free ends thereof extending laterally outwardly of the edges of said neck.

3,868,985

PROCESS OF ADHERING POLYESTER TEXTILE MATERIAL TO RUBBER AND THE PRODUCTS PRODUCED THEREBY

Louis W. Georges, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 123,011, March 10, 1971, abandoned. This application Nov. 17, 1972, Ser. No. 307,755

Int. Cl. B60c *1/00*; **B32b** *25/10*

U.S. Cl. 152—330 R **9 Claims**

1. The process of producing an article by bonding a polyester textile material to a rubber compound comprising the successive steps of

combining (a) a latex of a copolymer prepared from a monomer mixture of at least 50% of a conjugated diene of from 4 to 8 carbon atoms and a polymerizable carboxy acid with (b) a water solution of an incompletely condensed resin which is a reaction product of a polyhydric phenol and an aldehyde of from 1 to 7 carbon atoms to form a dip mixture having a pH below 7,

treating the dip mixture with a volatile base to raise its pH to at least 7.5,

dipping the textile material in the dip mixture,

heating and drying the dipped textile material,

coating the textile material with an unvulcanized rubber compound,

and assembling and vulcanizing the coated textile material to form the finished article.

3,868,986

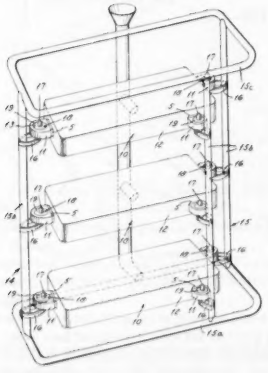
PATTERN ALIGNMENT MEANS FOR USE WITH LOST FOAM MOLDING PROCESS

Ralph A. Olsen, Grosse Pointe Woods, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,972

Int. Cl. B22c *7/02*, *15/22*

U.S. Cl. 164—7 **12 Claims**



1. Pattern apparatus for use in making multiple castings from a single pouring through a common sprue in a body of sand, the apparatus comprising:

a. a plurality of consumable foam type patterns which are combustible substantially without residue on subjection to a molten casting charge, each of said patterns having at least one ear effective to serve as a stabilizer,

b. a rigid stabilizing frame supported against movement, said frame having at least one extending finger for each of said patterns, each finger providing a support upon which said ear of one of said patterns may be journalled,

c. independent sprue means for conducting a molten metallic charge to said combustible patterns for consummation, and

d. means to prevent consummation of said frame during introduction of said molten charge.

3,868,987

METHOD OF ELECTRIC REFINING OF METALS BY SLAG, KNOWN AS THE E. S. R. METHOD, USING LIQUEFIED GAS TO ISOLATE THE SLAG AND ELECTRODE FROM THE AMBIENT AIR

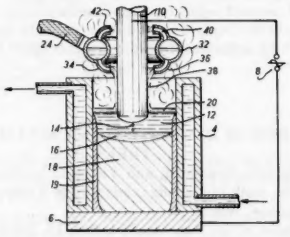
Jean G. Galey, Voisins Bretonneux, and Gerard Bentz, Elancourt-Trappes, both of France, assignors to L'Air Liquide-Societe Anonyme Pour L'Etude et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Feb. 12, 1973, Ser. No. 331,376

Claims priority, application France, Feb. 24, 1972, 72.06204

Int. Cl. B22d *27/02*

U.S. Cl. 164—52 **2 Claims**



1. A method of producing a high purity metal by electroslag refining at atmospheric pressure, comprising passing in electric current between a consumable electrode of the material to be refined and a mass of already refined metal through a molten and electrically conductive slag, and pouring a liquefied gas in liquid phase, which is substantially inert to said metal, downwardly along at least a lower part of the electrode to form a film over at least the lower part of the electrode which isolates said lower part of the electrode from the ambient air and then over the upper surface of the slag thereby to form a liquid layer on said slag from which it is separated by a continuous layer of vapor isolating said slag from the ambient air, the flow rate of said liquefied gas being sufficient to form said liquid layer.

3,868,988

METHOD OF CONTINUOUS CASTING MOLTEN COPPER IN A SEAMLESS-PIPE-SHAPED MOULD

Eror Olov Nikolaus Hansson, and Johan Olov Bror Hertsius, 97 Karlavagen, both of Stockholm, Sweden

Filed Mar. 12, 1973, Ser. No. 340,151

Claims priority, application Sweden, Mar. 10, 1972, 3025/72

Int. Cl. B22d *11/00*

U.S. Cl. 164—69 **4 Claims**

4. A casting method for the continuous production of elongated metal ingots which comprises

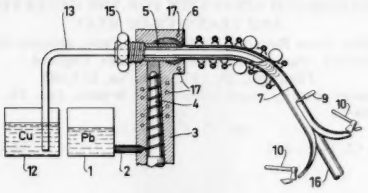
a. continuously extruding a first metal so as to form a solid thin-walled mould having the general shape of a seamless pipe,

b. continuously injecting into the interior of said solid pipe-shaped mould a molten mass of a second metal,

c. regulating the rate of extrusion of said first metal and the rate of injection of said second metal so that the linear speed of said solid pipe-shaped mould and linear speed of the molten mass of second metal contained therein are substantially the same,

d. continuously regulating both the thickness of the pipe-shaped mould and the amount of cooling applied to its outside surface so that:

1. the inner surface of the solid pipe-mould will not melt from the heat contained in the mass of second metal that has been injected therein, and



2. the inner surface of the pipe-mould will not clad to the mass of second-metal that has been injected therein,

e. said first metal having a lower melting point than said second metal, and

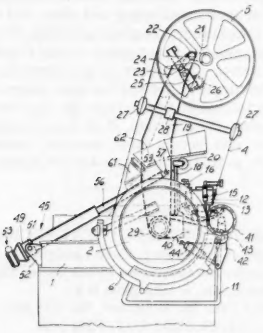
f. removing the pipe-shaped mould from around said injected second metal after said second metal has solidified.

3,868,989

APPARATUS FOR CONTINUOUS CASTING WITH A NUMBER OF CASTING POSITIONS

Giulio Properzi, Via Pietro Cossa 1, Milan, Italy

Filed May 8, 1973, Ser. No. 358,433
Claims priority, application Italy, May 10, 1972, 24182/72
Int. Cl. B22d *11/06*
U.S. Cl. 164—278 **4 Claims**



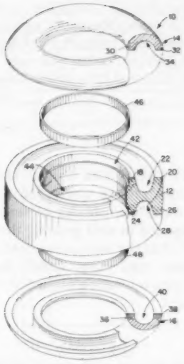
1. An apparatus for continuous casting of metal, comprising a frame, a casting wheel rotatably supported by said frame, a crucible for feeding molten metal to said casting wheel, a peripheral groove in said casting wheel, a metal band covering said groove along an arc portion to define a metal receiving mold therewith, a band pressing roller arranged substantially at the point at which molten metal is fed into said groove, an idle pulley for said band arranged at a distance from said casting wheel, a support structure for said idle pulley and for said band pressing roller, and means for cooling said casting wheel and said band, wherein said support structure includes a column supporting said idle pulley at one end and hinged at the other end to said frame coaxially with said casting wheel and an arm rigid with said column for supporting said band pressing roller, and wherein said crucible is adjustably supported by said column, the apparatus further comprising means for angularly displacing said column and means for displacing said crucible with respect to said column to position said crucible in any preferred casting position along a relevant arc of said casting wheel.

3,868,990

CORE MOLD AND METHOD FOR MAKING SAME

Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 29, 1973, Ser. No. 392,617
Int. Cl. B22c *9/10*
U.S. Cl. 164—369 **11 Claims**



1. A core of material comprising:

a body in cross-section defining first and second outwardly extending legs and a depression therebetween, and third and fourth outwardly extending legs and a depression therebetween.

a first side portion in cross-section defining first and second legs fixed to the first and second legs of the body, and a depression therebetween positioned along the depression defined between the first and second legs of the body; and a second side portion in cross-section defining first and second legs fixed to the third and fourth legs of the body, and a depression therebetween positioned along the depression defined between the third and fourth legs of the body.

8. A method of providing a core of formable material comprising:

forming a core body defining first and second depressions;

forming a first side portion defining a depression;

forming a second side portion defining a depression;

fixing the first side portion to the body with the depression of the first side portion along the first depression of the body; and

fixing the second side portion to the body with the depression of the second side portion along the second depression of the body.

3,868,991

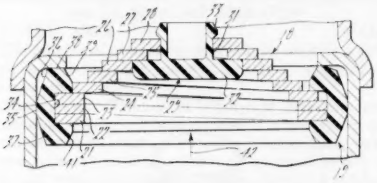
VALVE ASSEMBLY

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Filed Sept. 14, 1972, Ser. No. 288,934
Int. Cl. F16k *15/14*; G05d *11/02*
U.S. Cl. 165—38 **19 Claims**

17. In a hot water system for supplying an automotive heater core, including a first conduit leading to the inlet of the heater core, a second conduit leading from the outlet of the heater core, and a by-pass conduit connecting the second conduit to the first conduit: a helical coil spring made of wire having a rectangular cross-sectional shape disposed with the by-pass conduit; the coils of said spring having a plurality of relatively large outer turns of constant diameter and successive turns of gradually decreasing diameter, said coils overlap-

ping one another so that the spring is normally closed; central plug means for preventing flow through the innermost spring coil, said coils being separable in response to a pressure differential in one direction to permit flow therethrough between the coils thereof; a generally annular element formed of an elastomeric material disposed in said by-pass conduit; means defining an outer peripheral surface on said element sealingly



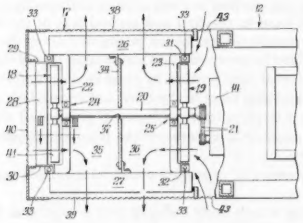
engaging the inside wall of said by-pass conduit; and means defining a continuous groove about the inside periphery of said element, the outer peripheries of said coils of constant diameter being disposed in said groove, the flexibility of said element being such that the next innermost coil from the ciols of constant diameter may move axially between open and closed positions during operation of the valve without interference by said element.

3,868,992

GROSS FLOW COOLING SYSTEM

Marvin G. Getz, Morton, and Erwin J. H. Bentz, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 20, 1973, Ser. No. 333,684
Int. Cl. F24h *3/06*
U.S. Cl. 165—51 **11 Claims**



1. A cooling system, mounted on a frame, comprising:

a pair of axially spaced and rotatable first and second fan means for pumping air into chamber means defined therebetween,

drive means operatively connected to each of said first and second fan means for selectively rotating the same, baffle means comprised of a single plate disposed within said chamber,

said drive means comprising a drive shaft extending through said baffle means and connected at opposite ends thereof to said first and second fan means,

first fluid cooling means extending traversely between said first and second fan means to define a first side of said chamber means whereby air pumped into said chamber means will exit through said first fluid cooling means,

a second fluid cooling means extending traversely between said first and second fan means in at least generally parallel and laterally spaced relationship relative to said first fluid cooling means to define a second side of said chamber means,

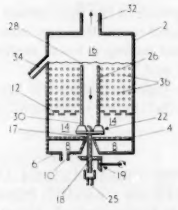
further comprising a third fluid cooling means extending traversely between said first and second fluid cooling means and adjacent to said first fan means to define a third side of said chamber means, and each of said first and second fan means comprising a plurality of fan blades, a first chordal angle of the fan blades of said first fan means being greater than a second chordal angle of the fan blades of said second fan means.

3,868,993

METHOD AND APPARATUS FOR THE GENERATION AND TRANSFER OF HEAT

Whalley Vowe Battcock, Bletchley, England, assignor to Coal Industry (Patents) Limited, Lancashire, England

Filed Dec. 29, 1971, Ser. No. 213,685
Claims priority, application Great Britain, Jan. 29, 1971, 03458/71
Int. Cl. F28d *13/00*
U.S. Cl. 165—104 **14 Claims**



1. Heat generating and transfer apparatus including a combustor body, a gas permeable support plate located within the combustor body and adapted, in use, to support a first fluidised bed of particulate material, combustion-sustaining gas medium inlet means located below said plate, fuel inlet means located above the plate, a screen located within the combustor body and adapted in use to support a second fluidised bed of particulate material, said screen being situated above and spaced from the support plate and fuel inlet means, the screen being adapted to permit flow of the gas medium and heat conductive matter therethrough, fluid heat exchange means located above said screen and material transfer means adapted, in use, to transfer heat conductive matter.

3,868,994

LIQUID METAL OPERATED HEAT EXCHANGER

John Paul Petrek, Glastonbury, Conn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 26, 1973, Ser. No. 335,851
Int. Cl. F28d *7/12*; **F28f** *9/02*
U.S. Cl. 165—142 **13 Claims**

1. A shell and tube heat exchanger organization in which heating fluid is circulated in heat exchange relation with a fluid to be heated comprising:

a. a shell;

b. an outer tube having an open end and a closed end housed within said shell;

c. an inner tube having a pair of concentrically spaced walls defining an axial passage and a first annulus concentrically spaced therefrom and means for closing one end of said first annulus;

d. said inner tube having an external diameter less than that of the internal diameter of said outer tube and extending coaxially into said outer tube from the open end thereof with its leading end axially spaced from the closed end of said outer tube to define a second annulus in fluid communication with said axial passage;

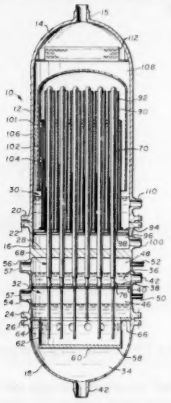
e. means to direct a flow of heating fluid through said axial passage and said second annulus;

f. means for passing an inert gas into said first annulus; and

g. means for circulating fluid to be heated through said

shell externally of said outer tube in heat exchange relation therewith;

said shell includes means forming a plenum in fluid communication with said axial passage and said second annulus in said inner tube, said plenum containing a body of heating fluid therein and a gas space thereabove and wherein the axial passage through said inner tube extends below the level of said body of heating fluid and said second annulus communicates with said gas space, said plenum having means for venting said gas space.



3,868,995

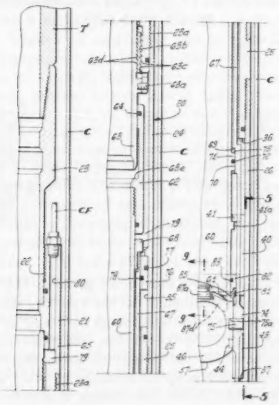
SUB-SURFACE SAFETY VALVE

Talmadge L. Crowe, Houston, Tex., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed June 15, 1973, Ser. No. 370,354

Int. Cl. E21b *43/12*; F16k *11/20*

U.S. Cl. 166—224 A **23 Claims**



1. In a subsurface shutoff valve for wells adapted to be supported in a well fluid production pipe: a body having a flow passage therethrough; shutoff valve means including a member shiftable between a first position closing said passage and a second position at which said passage is open; actuator means for shifting said member between said positions, including means defining a control fluid pressure chamber for moving said member to said second position and means responsive to the pressure of well fluid in the production pipe for biasing said member to said first position upon reduction in the pressure of control fluid in said chamber; said member including by-pass valve means for equalizing the well fluid across said shutoff valve means before said member is moved from said first position to said second position.

3,868,996

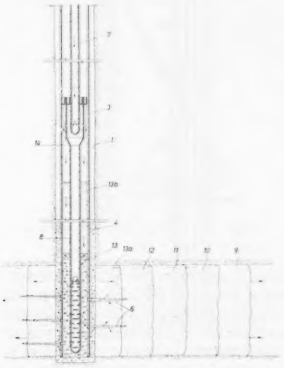
BUFFER-REGULATED TREATING FLUID POSITIONING PROCESS

James H. Lybarger, Metairie, La.; Ronald F. Scheuerman, Bellaire, and George Thomas Karnes, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1974, Ser. No. 470,101

Int. Cl. E21b *43/04, 43/26, 43/27*

U.S. Cl. 166—250 **21 Claims**



16. In a process in which the fluid is positioned in a selected remote location by forming a temporarily viscous fluid and flowing it into the selected location before the fluid viscosity is significantly reduced, the improvement which comprises:

dissolving in an aqueous liquid at least one each of a cellulose ether, a weak acid and a weak acid salt;

arranging the solution components to provide a weakly acidic solution having a viscosity that becomes significantly reduced in response to a time-temperature exposure of selected severity; and

flowing the weakly acidic solution into the selected location at a rate causing it to arrive at least substantially as soon as it has received a time-temperature exposure of the selected severity.

3,868,997

PROCESS FOR PREPARING AND USING AQUEOUS POLYACRYLAMIDE SOLUTIONS FOR THE SECONDARY RECOVERY OF OIL

Richard J. Pogers, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 3, 1973, Ser. No. 320,789

Int. Cl. E21b *43/22*

U.S. Cl. 166—275 **7 Claims**

1. A process for the secondary-type recovery of oil comprising in combination the injection into a subterranean oil-bearing formation of an aqueous polyacrylamide solution comprising the solution prepared by:

a. chilling a polymer gel comprised of polyacrylamide to about −30° to about −320°F.,

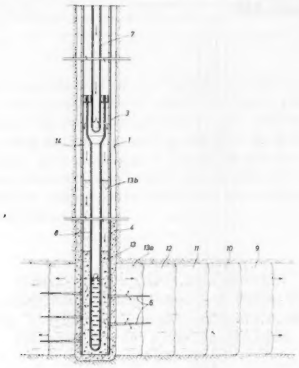
b. grinding the gel while chilled to form frozen particles of the polymer having an average particle size in the range of about 250 to about 1000 microns,

c. dissolving the ground particles of the polymer gel in water, whereby oil is displaced through said oil-bearing formation.

3,868,998
SELF-ACIDIFYING TREATING FLUID POSITIONING PROCESS

James H. Lybarger, Metairie, La.; Ronald F. Scheuerman, Bellaire, and George Thomas Karnes, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1974, Ser. No. 470,089
Int. Cl. E21b *43/04, 43/26, 43/27*
U.S. Cl. 166—278 15 Claims



10. In a process in which fluid is positioned in a selected remote location by forming a temporarily viscous fluid and flowing it into the selected location before the viscosity of the fluid is significantly reduced, the improvement comprising;

dissolving in an aqueous liquid at least one each of a cellulose ether, a fluoride salt, and a relatively slowly reacting acid-yielding material;

arranging the solution components to provide a self-acidifying, temporarily viscous solution in which the viscosity is significantly reduced in response to a time-temperature exposure of a selected severity; and

flowing the self-acidifying solution into the selected location at a rate causing it to arrive at least substantially as soon as it has received a time-temperature exposure of the selected severity.

3,868,999
METHOD FOR PREFERENTIALLY PRODUCING PETROLEUM FROM RESERVOIRS CONTAINING OIL AND WATER

Charles A. Christopher, Jr., Houston, and Abdus Satter, Conroe, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 27, 1972, Ser. No. 318,786
Int. Cl. E21b *33/13*
U.S. Cl. 166—292 5 Claims

1. A method for increasing the relative permability to oil and decreasing the relative permeability to water in the vicinity around a production well penetrating a subterranean hydrocarbon reservoir comprising:

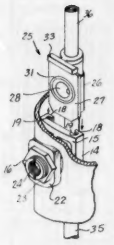
injecting a slug of fluid into the reservoir via the production well the fluid comprising a hydrocarbon solvent, colloidal silica, water and a polymeric material and

returning the well to production.

3,869,000
WELL COUPLING AND METHOD OF ATTACHING THE COUPLING OF A WELL CASING

Donald Hugh English, Box 82, RD. 1, Mt. Herman, N.J. 07825

Filed Aug. 31, 1973, Ser. No. 393,495
Int. Cl. E21b *33/03, 43/00*
U.S. Cl. 166—315 8 Claims



1. A pipe coupler for connecting a pipe through a casing to a line comprising:

a. a first coupler member having on one side thereof a vertical trackway with two open ends;

b. a bore extending through said first coupler member for communicating said pipe to said line;

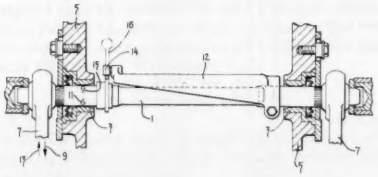
c. a second coupler member having a plate formed thereon and adapted for sliding movement in said trackway through either open end thereof; and

d. a stop formed on said plate to limit the movement of said plate through said trackway.

3,869,001
FULCRUM BUSHING ON THE RESILIENT BAR DRAFT SENSING

Otto Mueller, Jr., Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Apr. 18, 1974, Ser. No. 462,003
Int. Cl. A01b *63/112*
U.S. Cl. 172—7 5 Claims



1. A draft sensing apparatus for a tractor having draft means for connecting an implement to the tractor, said apparatus including a resilient beam supported by a pair of spaced fulcrum bearings carried by the tractor, said means connected to the beam adjacent the ends thereof extending beyond said fulcrum bearings and adapted to cause bending of the beam about said bearings, deflection sensing means for measuring the deflection of the beam caused by draft forces acting on the beam through the draft means, said fulcrum bearings having internal arcuate surfaces tapering from a relatively large diameter to a small diameter and back to a large diameter, the internal surface formed so that a plane passing through the smallest diameter of the bearing extends at an acute angle to the axis of the bearing whereby the effective fulcrum point in said bearing contacts the rearmost portion of said beam at a variable point depending on the rotational position of the beam.

3,869,002

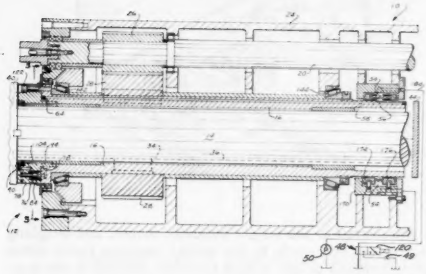
SPINDLE CLAMP

Carl F. Koenig, III, Montgomery, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jan. 14, 1974, Ser. No. 433,233

Int. Cl. B23c *1/02*; B23b *39/02*

U.S. Cl. 173—166 **14 Claims**



1. An apparatus comprising a housing, a rotatable longitudinally extending drive sleeve at least partially disposed within said housing, said drive sleeve having an axially outer end portion, a longitudinally extending spindle telescopically disposed within said drive sleeve and movable axially relative to said drive sleeve between a retracted position and an extended position extending axially outwardly beyond said axially outer end portion of said drive sleeve, and clamp means connected with said drive sleeve and operable between an engaged condition holding said spindle against axial movement relative to said drive sleeve and a disengaged condition in which said clamp means is ineffective to hold said spindle against axial movement relative to said drive sleeve, said clamp means including a generally cylindrical metallic clamp member circumscribing said spindle, said clamp member including a rigid metallic body portion having a first radial thickness and a metallic membrane portion disposed in engagement with said spindle and having a second radial thickness which is less than said first radial thickness, said metallic membrane portion of said clamp member being resiliently deflectable radially inwardly under the influence of a first fluid pressure to grip said spindle upon operation of said clamp means from the disengaged condition to the engaged condition, first surface means cooperating with said body and membrane portions of said clamp member to define a pressure chamber, second surface means disposed axially outwardly of said axially outer end portion of said drive sleeve for at least partially defining a piston chamber which is at least partially disposed axially outwardly of said axially outer end portion of said drive sleeve, a piston disposed in said piston chamber and located axially outwardly of said axially outer end portion of said drive sleeve, said piston including a first end surface having a relatively large area and a second end surface having a relatively small area, means for exposing said second end surface of said piston to a body of fluid connected in fluid communication with and filling said pressure chamber, and actuator means for effecting operation of said clamp means from the disengaged condition to the engaged condition by exposing said first end surface of said piston to a second fluid pressure which is less than said first fluid pressure to thereby effect an increase in the fluid pressure in said body of fluid to a fluid pressure which is at least as great as said first fluid pressure.

3,869,003

PILE DRIVERS

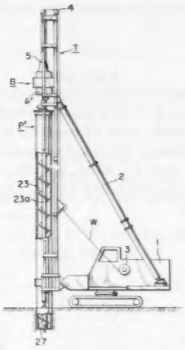
Shigeru Yamada; Mamoru Hamano, both of Tokyo, and Kaname Nakayama, Funabashi, all of Japan, assignors to Sanwa Kizai Kabushiki Kaisha, Toyko, Japan

Filed Dec. 26, 1972, Ser. No. 318,543

Claims priority, application Japan, Dec. 25, 1971, 47-1062; Apr. 13, 1972, 47-42895

Int. Cl. E02b *17/144*

U.S. Cl. 175—171 **8 Claims**



1. A pile driving apparatus comprising, in combination: a tower erected on a base, adapted to support a hollow pile to be driven into the ground; a plurality of reaction-receiving elements arranged in pairs vertically at suitable intervals along the length of said tower; a monkey slidably suspended from said tower and having stoppers attached thereto and successively engageable with said pairs of elements; said monkey constituting part of press-in means and being in the form of a framework with a central opening; an assembly support slidably suspended from said framework; actuating hydraulic cylinders disposed below said monkey for driving the pile into the ground by the pressing force provided by said cylinders; and earth auger means including an auger screw insertable into the hollow pile, whereby the latter can be driven into the ground by the combined pressing force provided by said cylinders, as aforesaid, and the excavating force of said screw.

3,869,004

METHOD OF FINE ADJUSTING BALANCES AND BALANCE FOR PERFORMING THIS METHOD

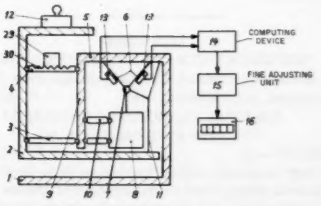
Mario Gallo, Kronleinstr. 1, Zurich, Switzerland

Filed Aug. 22, 1972, Ser. No. 282,862

Claims priority, application Switzerland, Apr. 24, 1972, 6079/72

Int. Cl. G01g *3/14*

U.S. Cl. 177—25 **5 Claims**



1. A method of automatically fine adjusting balances comprising a computing instrument and digital display means, in

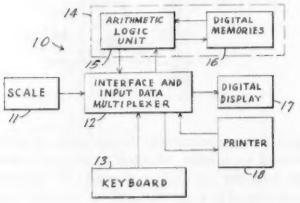
which the load is determined throughout the measuring range in terms of *m* measuring units that are smaller than the units *d* of the digital display means, comprising, for each weighing, the steps of determining whether a measured value by the computing is within a predetermined zero range, if so deducting as many measuring units *m* from the measured value as correspond to half the multiple of measuring units *m* as are equal to one display unit *d*, and replacing a previously stored adjusting factor with the result of said deducting step as a fresh adjusting factor, and if not deducting the previously stored adjusting factor from the measured value determined by the computing instrument and indicating the result in multiples of display units *d*.

3,869,005

VALUE COMPUTING SCALE

Roger B. Williams, Jr., Sylvania, Ohio; Richard C. Loshbough, Temperance, Mich., and Edward G. Pryor, Toledo, Ohio, assignors to Reliance Electric Company, Toledo, Ohio

Filed Apr. 17, 1974, Ser. No. 461,582
Int. Cl. G01g *23/22, 23/14*
U.S. Cl. 177—25 **4 Claims**



1. A weighing and computing scale comprising, in combination, integrated circuit microcomputing means including an arithmetic logic unit, a sequence controller and data registers, weighing scale means for generating gross weight data, data input means having a plurality of digit keys for sequentially entering data into said weighing and computing scale, buffer and memory means for receiving tare weight data and gross weight data from said scale means and price data from said digit keys on said data input means and functioning as an interface with said arithmetic logic unit, said buffer and memory means receiving and storing tare weight data selectively from said scale means and said digit keys on said data input means, the tare weight data, the gross weight data and the price data being related to each of a plurality of successive weighed articles, and digital display means for visually indicating the price data, computed net weight data and value data computed from such data, said sequence controller causing said arithmetic logic unit and registers to compute the net weight and the value of the weighed articles and controlling the supplying of such computed net weight and value and the price data through said buffer and memory means to said display means.

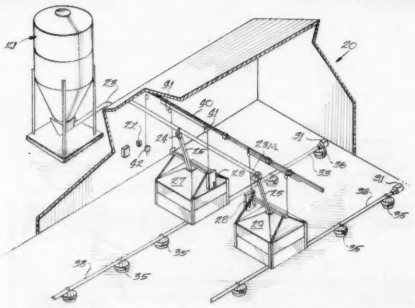
3,869,006

WEIGHT CONTROLLED FEEDER SYSTEM

Eldon Hostetler, Middlebury, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Aug. 25, 1972, Ser. No. 283,724
Int. Cl. G01g *13/02*
U.S. Cl. 177—60 **3 Claims**

1. Feed weighing means for use with a feed dispensing apparatus including feed-receiving hopper means adapted to receive a flow of feed, hopper support means directly supporting the hopper means at a first location to prevent significant hopper movement when feed weight is added to the hopper, weight indicator means, means extending directly from a second location on the hopper means to the weight indicator means and connecting the feed receiving hopper means second location and the weight indicator means for moving the weight indicator means through a limited range of positions in response to the weight of feed received in the hopper means



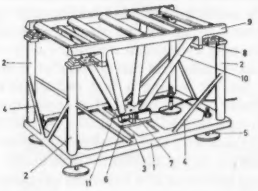
and transferred to the weight indicator means, and weighing switch means actuatable by the weight indicator means when a predetermined weight of feed has been received in the hopper means and the weight indicator means has been disposed in a predetermined corresponding position.

3,869,007

WEIGHING TABLE PARTICULARLY FOR A ROLLER CONVEYOR

Rolf Paul Haggstrom, and Bengt-Ake Karlsson, both of Karlskoga, Sweden, assignors to AB Bojors, Bojors, Sweden

Filed Oct. 25, 1973, Ser. No. 409,573
Claims priority, application Sweden, Nov. 13, 1972, 14673/72
Int. Cl. G01g *3/14, 21/24*
U.S. Cl. 177—211 **8 Claims**



1. A weighing table especially adapted for use in a roller conveyor comprising in combination:

a supporting frame including a plurality of upstanding members,

an inner unit for carrying the load to be weighed,

a single force transducer having a first part thereof connected to said supporting frame,

said inner unit including a plurality of connecting members extending from said inner unit to a further element which is in turn connected to a second part of said force transducer,

a plurality of support means each connecting said inner unit to a respective one of said upstanding members adjacent its upper end, each of said support means comprising a thin, flat, flexible member but with high tensile strength, each of said members lying in the same horizontal plain, whereby said force transducer is subject to vertical loads but transverse force components on said inner unit are resisted by said plurality of support means.

3,869,008

BALANCE SCALE

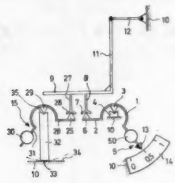
Ernst Kuhnle, and Josef Schwarz, both of Balingen, Germany, assignors to Bizerba-Werke Wilhelm Kraut K.G., Balingen/-Wurtt, Germany

Filed Jan. 11, 1974, Ser. No. 432,628

Claims priority, application Germany, Jan. 12, 1973, 2301361

Int. Cl. G01g *1/06, 1/02*

U.S. Cl. 177—217 **6 Claims**



1. In a balance scale, a combination comprising a load support; mounting means mounting said load support for movement in an upright path between a plurality of positions in each of which said load support has the same orientation; a first and a discrete second balance lever fulcrumed for separate pivotal movement in opposite directions; first and second knife edge bearings which respectively fulcrum said first and second balance levers; and means for coupling said load support with each of said balance levers for simultaneous pivotal deflection of both levers through identical angular increments but in opposite directions in response to movement of said load support in said upright path and vertical transmission of motion from said load support to said balance levers via said coupling means, said coupling means comprising a third knife edge bearing and a fourth knife edge bearing, each of said bearings comprising a first portion constituting a knife edge and a second portion constituting a bearing member, one portion of said first bearing being provided on said first balance lever and the other portion of said first bearing being rockable so that said one portion has limited freedom of displacement in a direction transversely of said path, one portion of said third bearing being provided on said first balance lever and the other portion of said third bearing being provided on said load support, one portion of said fourth bearing being provided on said second lever and the other portion of said fourth bearing being provided on said load support.

3,869,009

SCALE

Ernst Kuhnle, Balingen, Germany, assignor to Bizerba-Werke Wilhelm Kraut KG, Balinge/Wurttemberg, Germany

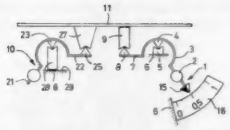
Filed Jan. 11, 1974, Ser. No. 432,629

Claims priority, application Germany, Jan. 12, 1973, 2301360

Int. Cl. G01g *1/06*

U.S. Cl. 177—217 **4 Claims**

1. In a scale, particularly a table scale, a combination comprising a balance lever fulcrumed for pivotal movement; a load support above said balance lever for supporting a load to be weighed; mounting means mounting said load support for movement independently of said balance lever in an upright path between a plurality of positions in each of which its orientation in space is unchanged; motion-transmitting coupling means coupling said load support with said balance lever to impose upon the latter angular incremental displacements which are indicative of the movements of said load support in said path; a fulcrumed additional balance lever below said



load support; and additional coupling means directly coupling said additional balance lever with said load support.

3,869,010

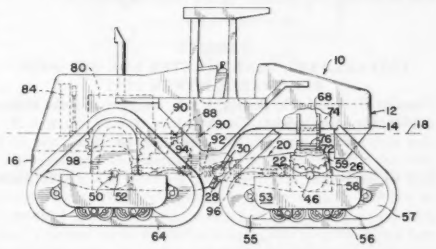
CRAWLER TRACTOR

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 11, 1972, Ser. No. 287,596

Int. Cl. B62d *55/00*

U.S. Cl. 180—9.5 **4 Claims**



1. A powered crawler tractor comprising: a rigid frame defining a pair of end portions; first and second axle members disposed on either side of one end portion; third and fourth axle members disposed on either side of the other end portion; four endless track assemblies, one track assembly being mounted on each of said axle members; means for allowing a degree of travel of the first and second axle members relative to each other and to the frame, in a back and forth path generally toward and away from the general plane of the frame; means for driving each of said four track assemblies; and wherein said means for allowing said degree of travel comprise a first elongated arm member and first pivot means connecting one end of the first elongated arm member and the frame, the other end of the first elongated arm member having said first axle member fixed thereto, and a second elongated arm member and second pivot means connecting one end of the second elongated arm member and the frame the other end of the second elongated arm member having said second axle member fixed thereto.

3,869,011

STAIR CLIMBING TRACKED VEHICLE

Howard Jensen, Huntington, N.Y., assignor to Ramby, Inc., Bronxville, N.Y.

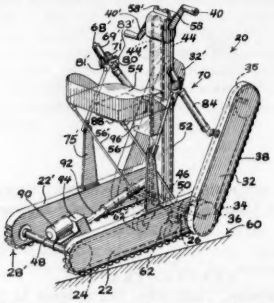
Filed Jan. 2, 1973, Ser. No. 320,115

Int. Cl. B62d *55/04*; **B62b** *9/02*

U.S. Cl. 180—9.24 **14 Claims**

1. A stair-climbing vehicle comprising a pair of main tracks, a pair of auxiliary tracks each being aligned and pivotally joined to a main track adjacent the forward end of said respective main track, propulsion means for driving said main tracks, independently of each other when necessary, self-leveling seat means mounted on said vehicle, automatic pitch-control

means mounted to act between each prospective main track and its auxiliary track for limiting at least the rate of pivoting of said auxiliary track with respect to said main track from below said main track towards alignment therewith, said pitch-control means comprising an elbow linkage between



each auxiliary and main track pair and having a hydraulic cylinder forming at least part of the linkage forearm and also having a locking means for maintaining the linkage and cylinder in the raised angled position and for locking the linkage and unlocking the cylinder in the lowered position.

3,869,012

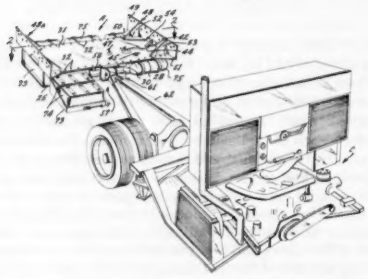
UNITARY FUEL TANK-BOLSTER FOR BUS WITH REMOVABLE POWER UNIT

Theodor C. Schubach, Bonita, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Apr. 18, 1974, Ser. No. 461,852

Int. Cl. B62d *21/16*

U.S. Cl. 180—11 **11 Claims**



1. A unitary bolster-tank for a bus or similar vehicle having a power unit removably docked in a space provided therefor in the aft end of the vehicle body, said bolster-tank comprising:

a bolster element of box cross-sectional shape extending transversely across the vehicle body forwardly of the space provided within the body for the power unit,

means connecting the ends of the bolster element to structural members on opposite sides of the vehicle body with sufficient strength to withstand and transfer to the vehicle body operating stresses imposed on the bolster element by the power unit,

end means closing off and sealing each end of a selected portion of the interior of the bolster element to define between said end means a sealed space of sufficient volume to comprise a fuel tank for the vehicle in which the bolster element is mounted,

fuel tank accessory means operatively incorporated in the sealed space between the two end means to complete a unitary bolster-tank, and

hitch means mounted on a medial portion of the bolster-tank for releasably connecting to the bolster-tank a forward element of a power unit docked in the space provided therefor in the vehicle body.

3,869,013

FOUR-WHEEL-DRIVE VEHICLES

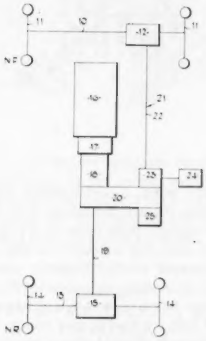
Brian Colin Pagdin, Sutton Coldfield, and Oswald Webb, Coventry, both of England, assignors to GKN Transmissions Limited, Birmingham, England

Filed Feb. 15, 1973, Ser. No. 332,765

Claims priority, application Great Britain, Feb. 15, 1972, 6857/72

Int. Cl. B60k *17/34, 17/30*

U.S. Cl. 180—44 R **8 Claims**



1. A four-wheel-drive vehicle comprising drivable front and rear sets of wheels, the wheels of at least one set being connected by a differential gear; a prime mover; change speed means having an input and an output, the input being arranged to be driven by the prime mover and the output being connected by a first driving connection to drive the wheels of said one set; a two-part second driving connection between the wheels of said other set and either the first driving connection or said output, the parts of said second driving connection being drivingly connected respectively to the wheels of said other set and said output or first connection; a gear pumping device comprising first and second meshing gear means connected respectively to said parts of the second driving connection, relative rotation of said gear means resulting from a difference in the speed of rotation of said front and rear sets of wheels causing pumping of non-gaseous fluid; a circuit for the pump fluid; and variable orifice means in the circuit and operable by the pressure of the fluid being pumped to increase the resistance encountered by fluid being pumped around the circuit with increase in the speed of relative rotation between the first and second gear means whereby, as said difference in the speed of rotation of said front and rear wheels increases, an increasing proportion of the torque previously applied to said one set of wheels by said prime mover is applied to said other set of wheels.

3,869,014

STARTING INTERLOCK SYSTEM

Joseph A. Federspiel, Port Washington, and Edward W. Pawlowski, Belgium, both of Wis., assignors to FMC Corporation, San Jose, Calif.

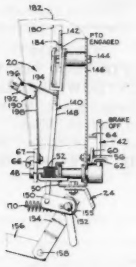
Filed Feb. 19, 1974, Ser. No. 443,662

Int. Cl. B60r *18/00;* **A01d** *75/18*

U.S. Cl. 180—53 R **14 Claims**

1. A starting interlock system for a vehicle powered by an engine which is started by a starter motor in a starting circuit receiving its power from a battery in response to closing a starter switch, the vehicle including wheels driven from the

engine through a transmission and brakes for arresting movement of the wheels, the vehicle also including a power take-off mechanism for driving an implement; the improvement which comprises a single interlock switch in said starting



circuit having a body and a switching element, and means responsive to movement of the brakes to their locking position and disengagement of said power take-off mechanism for partially completing said starting circuit for permitting starting of the engine upon closing of the starter switch.

3,869,015

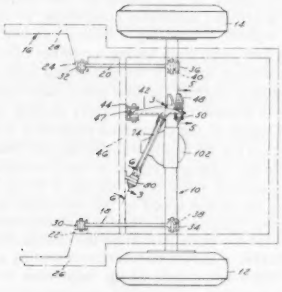
MOTOR VEHICLE SUSPENSION

William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1973, Ser. No. 421,473

Int. Cl. B60g *9/02*

U.S. Cl. 180—71 **13 Claims**



1. A suspension system for a motor vehicle having a pair of driving wheels, a rigid axle housing rotatably supporting said wheels and a vehicle frame structure,

said suspension system including a pair of axle positioning members operatively connected to said axle housing and said frame structure,

a suspension system including a pair of axle positioning members operatively connected to said axle housing and said frame structure,

a suspension arm interposed between said frame structure and said axle housing,

first pivot means connecting said suspension arm to said frame structure and second pivot means connecting said arm to said axle housing,

said first pivot means having a generally transverse pivot axis,

a suspension link,

a first connector means connecting one end of said suspension link to said frame structure,

said first connector means being disposed on the pivot axis of said first pivot means,

second connector means connecting the other end of said suspension link to said suspension arm,

one of said connector means being constructed to permit limited displacement of said suspension link in a direction parallel to its longitudinal axis relative to one of said frame structure and suspension arm.

3,869,016

REAR AXLE SUSPENSIONS FOR MOTOR VEHICLES

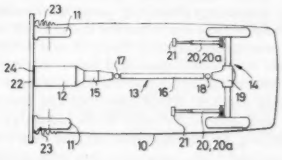
Karl Astheimer, Bischofsheim, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 29, 1973, Ser. No. 346,131

Claims priority, application Germany, Apr. 20, 1972, 2219318

Int. Cl. B60r *19/00*

U.S. Cl. 180—73 R **8 Claims**



1. A motor vehicle having a body, an engine mounted in a front portion of the vehicle body, a rear axle, a transverse pair of pivotal link assemblies forming guide means for the rear axle and each comprising a control arm that extends in a direction generally longitudinally of the vehicle and has at respective ends thereof a connection to the rear axle and a pivotal mounting to the vehicle body, and a closed drive line interconnecting the engine and the rear axle of the vehicle and arranged, in the event of rearward displacement of the engine due to frontal impact of the vehicle, to transmit a rearwardly directed force to the rear axle, the pivotal link assemblies being designed, in response to a predetermined loading in excess of that occurring under normal braking and driving conditions of the vehicle, to yield and permit rearward displacement of the rear axle, with conversion of kinetic energy into deformation work by the pivotal link assemblies.

3,869,017

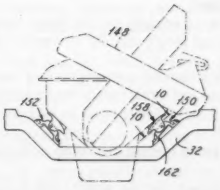
ENGINE MOUNTING AND ENERGY ABSORBING FRAME FOR A MOTOR VEHICLE

James R. Feustel, Taylor; Kenneth L. Hoyt, Farmington; Jonas Valukonis, Detroit, and John J. Corcoran, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1972, Ser. No. 295,378

Int. Cl. B60r *21/00*

U.S. Cl. 180—82 R **2 Claims**



1. An energy absorbing system for a motor vehicle comprising:

a vehicle frame assembly having plastically deformable energy absorbing frame sections,

a vehicle body and body mounting means supporting said body on said frame assembly,

a vehicle engine and one-way break-away engine mounting means connecting said engine to said frame assembly,

said engine mounting means and said body mounting means being constructed to support said engine and said body, respectively, on said frame assembly during normal vehicle operating conditions,

said engine mounting means including frangible means and abutment means,

said frangible means being constructed to fracture and permit the forward displacement of said engine with respect to said frame assembly under the effects of a rearwardly directed impact force imposed upon said frame assembly that equals a predetermined magnitude, said body mounting means being constructed to support said body on said frame assembly under the effects of a rearwardly directed impact force on said frame assembly that at least equals said predetermined magnitude whereby said energy absorbing frame sections support the mass of said vehicle body but not the mass of said engine when a rearwardly directed force of said predetermined magnitude is imposed upon said frame assembly,

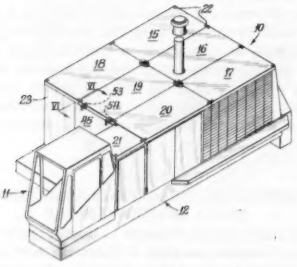
said abutment means being operatively interposed between said engine and said frame assembly and constructed to support said engine on said frame assembly against a force tending to displace said engine rearwardly with respect to said frame assembly that at least equals said predetermined magnitude.

3,869,018

ENGINE ENCLOSURE FOR HYDRAULIC EXCAVATORS

Thomas P. Muller, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 26, 1973, Ser. No. 326,996
Int. Cl. B62d *33/06*
U.S. Cl. 180—89 R **21 Claims**



1. A vehicle enclosure comprising:

a frame,

at least one pair of upright rear posts secured to a rearward end of said frame,

at least one pair of upright center posts secured to said frame and spaced longitudinally forwardly said rear posts ,

force transmitting means interconnecting upper ends of each pair of rear and center psots for transmitting loading forces imposed on said rear posts to said center posts and frame directly,

at least one top panel having mounting holes formed therethrough,

an upright side panel, having attachment holes formed on the upper end thereof, detachably mounted on said enclosure,

adjustment means, comprising a pin and slot connection positioned at each lateral end of said side panel and between said side panel and said frame, for selectively moving said side panel to align the attachment holes thereof into underlying relationship with respective ones of said mounting holes and

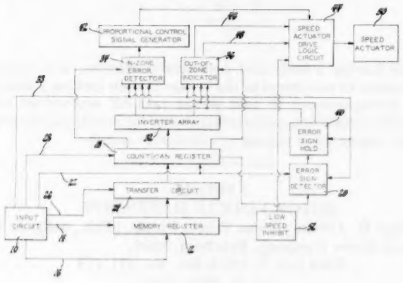
fastening means projecting through each one of said mounting holes and detachably engaging a respective one of said attachment holes.

3,869,019

DIGITAL SPEED CONTROL SYSTEM UTILIZING A COUNTDOWN REGISTER

Charles S. Cardani, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 24, 1970, Ser. No. 49,246
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 E **8 Claims**



1. A digital speed control system for maintaining a desired speed of a controlled apparatus comprising, in combination, a memory register for storing a binary number; means for supplying a first pulse train having a number of pulses representing the desired speed of the controlled apparatus to the memory register, wherein the first pulse train steps the memory register to generate therein a binary number representing the desired speed of the controlled apparatus; a countdown register; means for cyclically transferring the binary number stored within the memory register to the countdown register, supplying a second pulse train having a number of pulses representing the actual speed of the controlled apparatus to the countdown register, and clearing the countdown register, wherein the second pulse train steps the countdown register to generate therein a binary number representing a controlled apparatus speed error; and means responsive to the binary number representing a controlled apparatus speed error for maintaining the desired speed.

3,869,020

AIR CUSHIONED VEHICLE

Douglas W. Holland, 6851 N. Fremont Rd., East Syracuse, N.Y. 13057

Filed July 12, 1973, Ser. No. 378,696
Int. Cl. B60v *1/14*
U.S. Cl. 180—120 **12 Claims**

1. An air cushioned vehicle comprising:

a body member;

a power plant mounted to said body member capable of producing an air stream;

means for directing a first portion of the air stream in a substantially downward direction to elevate said body member;

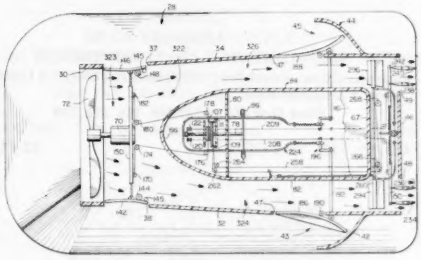
conduit means, carried by said body member, for conducting a second portion of the air stream in a substantially horizontal rearward direction,

said conduit means having an inlet for directly receiving the second portion of the air stream produced by said power plant,

said conduit means additionally having an outlet enabling the air stream entering said inlet to pass through said conduit means and then to exhaust through said outlet to the atmosphere in a substantially rearward direction to propel said body member forward;

air stream deflecting means, pivotally coupled to said body member between said inlet and outlet of said conduit means, for deflecting the second portion of the air stream in a substantially horizontal forward direction and to the atmosphere;

control means, coupled to said body member, for manipulating said air stream deflecting means to a first position wherein none of the air stream is deflected so the vehicle moves forward, to a second position wherein substantially



one-half of the air stream is deflected forward so the vehicle hovers in a fixed position, and to a third position wherein substantially all of the air stream is deflected forward so the vehicle moves rearward;

forward vane means, pivotally mounted to said body member adjacent said inlet of said conduit means, for deflecting a part of the air stream to the atmosphere in either lateral direction;

aft vane means pivotally mounted to said body member adjacent said outlet of said conduit means, for deflecting another part of the air stream to the atmosphere in either lateral direction; and

second control means, carried by said body member, for positioning said forward and aft vane means to deflect the air stream in the same lateral direction, when said control means has manipulated said air stream deflecting means to the second position, causing the vehicle to move in the opposite lateral direction without forward movement.

3,869,021

ROPE CLIMBING APPARATUS

Robert L. Sutherland, and Wayne M. Sutherland, both of P.O. Box 213, 1828 Steele, Laramie, Wyo. 82070

Filed May 20, 1974, Ser. No. 471,491

Int. Cl. A62b *1/14*

U.S. Cl. 182—3 **12 Claims**

1. Apparatus for climbing a rope, comprising:

chest means, including a flexible strap dimensioned to encircle the user's chest and a breast fixture securing the ends of said strap, for mounting upon the chest of the user;

hip means, including flexible straps to encircle the waist and upper thighs of the user, for mounting upon the hip region of the user;

knee means for mounting upon one leg of the user in the vicinity of the knee;

ankle means for mounting upon the other leg of the user in the vicinity of the ankle;

a first running clamp, permitting free movement of said rope therethrough in one direction while prohibiting movement of said rope therethrough in the other direction, affixed to said breast fixture;

a second running clamp, like the first, affixed to said knee means;

a third running clamp, like the first, affixed to said ankle means;

and tie means for flexibly securing said chest means to said hip means.

3,869,022

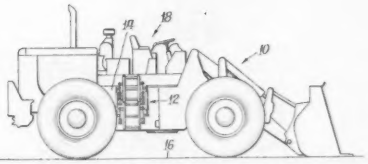
TELESCOPING STEP LADDER

Harold J. Wallk, Mendota, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 13, 1974, Ser. No. 479,170

Int. Cl. E06c *5/04*

U.S. Cl. 182—96 **7 Claims**



1. In a ladder assembly for attachment to a side support surface including a ladder having an upper frame portion and a lower frame portion, means for telescoping said ladder from an operative length and position to a shorter, stored length and position, and further including means for automatically extending said ladder from its stored length and position to its operative length and position in response to an operator thereon and for causing the ladder to be retracted to its stored length and position when released by the operator.

3,869,023

MECHANICAL LUBRICATING DEVICE AND METHOD

Ronald E. Thomson, Cambridge, and Philip J. Kast, Madison, both of Wis., assignors to Madison-Kipp Corporation, Madison, Wis.

Filed Jan. 22, 1973, Ser. No. 325,660

Int. Cl. F16n *7/16*

U.S. Cl. 184—15 A **8 Claims**

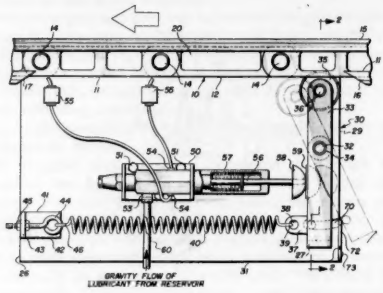
1. The method of lubricating a conveyor system which passes a lubricating station according to the steps of:

contacting said conveyor system intermittently with a member as said system passes said lubricating station;

transmitting energy from said system through said member to an energy storage means in the period of contact with a conveyor system;

releasing the energy stored in said storage means in an

impulse action to drive pump means; and,
dispensing fluid from said pump means to said conveyor



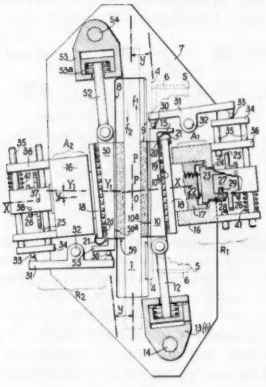
system;
whereby said conveyor system can be lubricated.

3,869,024

SELF RELEASING BRAKE DEVICE

Jean-Marc Hauth, Pont-A-Mousson, and Roland Claude Michel Cheylac, Augny, both of France, assignors to Pont-A-Mousson S.A., Pont-A-Mousson, France

Filed July 6, 1973, Ser. No. 376,994
Claims priority, application France, July 7, 1972, 72.24727
Int. Cl. F16d *55/228*
U.S. Cl. 188—72.5 **15 Claims**



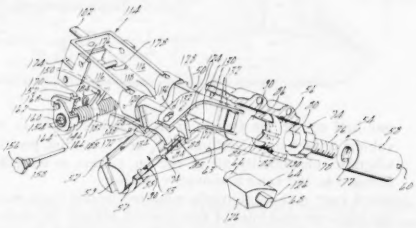
1. A self-releasing device for braking a moving element movable in opposite directions, such as a disc, having two parallel rubbing surfaces, the device comprising a support; two brake sub-assemblies disposed one on each side of the moving element on the support; each sub-assembly comprising support means fixed to the support and having a support surface slightly inclined with respect to the corresponding adjacent rubbing surface of the moving element, means defining a brake pad having a friction surface parallel to the corresponding rubbing surface and an inclined surface parallel to the corresponding support surface and co-operative with the support surface, actuating means connected to the pad and arranged to act on the pad in a direction for causing the pad to effect a given displacement relative to the support for braking; the two brake sub-assemblies being oriented in opposite directions on each side of the moving element so that, for a given direction of movement of the moving element and upon braking, a first of the two brake pads of the two sub-assemblies is self-releasing and a second of said two brake pads tends to be drawn along by the moving element in a direction corresponding to said displacement for braking and, in an opposite direction of movement of the moving element, said first brake pad tends to be drawn along by the moving element in a direction corresponding to said displacement for braking and said second brake pad is self-releasing, the support being capable of moving relative to the moving element in a direction substantially perpendicular to the rubbing surfaces; each sub-assembly having further means responsive to the direction of movement of the moving element for automatically arresting, in each direction of movement of the moving element, the braking displacement relative to the support of that one of the two brake pads which tends to be drawn along by the moving element in a direction for effecting its braking displacement before the other brake pad has reached the end of its given braking displacement relative to the support.

3,869,025

SELF-ADJUSTING BRAKE MECHANISM

James L. Oliver, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 10, 1972, Ser. No. 296,359
Int. Cl. F16d *65/56*
U.S. Cl. 188—79.5 GE **22 Claims**



1. A braking mechanism for use with a brake assembly of the type including a pair of brake shoes each shoe having a first end opposite from one another, a brake drum, and means supporting the shoes for movement from an initial position, into contact with the drum for effecting braking of the drum; the brake mechanism comprising:

actuator means including at least one tine adapted to be operatively engaged with the first end of each of the shoes for effecting a first movement of the shoes tending to effect contact with the drum; and

adjuster means operative concurrently with the operation of the actuator means and engaged with the tine and the first end of each of the shoes for effecting a second, further movement of the shoes toward the drum after the actuator means have moved the shoes beyond a predetermined distance toward the drum.

3,869,026

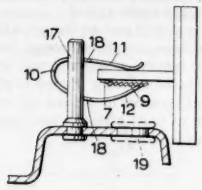
SHOE DRUM BRAKES

Frank Vernon Williams, Solihull, England, assignor to Girling Limited, Warwickshire, England

Filed Nov. 2, 1973, Ser. No. 412,121
Claims priority, application Great Britain, Nov. 17, 1972, 53120/72
Int. Cl. F16d *65/54*
U.S. Cl. 188—79.5 GT **5 Claims**

1. Means for adjusting the off position of a shoe in an internal shoe drum brake comprising a resilient pawl member and a ratchet member with which said pawl member is in co-operative engagement for relative movement in one direction, one member being mounted on the shoe and the other on the stationary backplate of the brake, wherein said pawl member

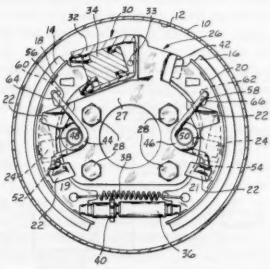
is a C-shaped member of resilient metal having two limbs of which the free ends are urged towards each other, one of said limbs bearing on one side of the shoe web and the other limb co-operating with ratchet teeth on the other side of the web.



3,869,027
DRUM BRAKE ASSEMBLY

Richard A. Chlebowski, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 24, 1973, Ser. No. 409,347
Int. Cl. F16d *51/14*
U.S. Cl. 188—340 **5 Claims**



1. In a drum brake assembly having a torque spider provided with a plurality of axially spaced-apart oppositely facing guide pads at the outer periphery thereof for slidably receiving a shoe web of an associated brake shoe between the guide pads and an actuator for moving the shoe into engagement with the drum, the improvement for maintaining the shoe from undesirable sliding into the drum during brake release, said improvement comprising:

a brake shoe hold-down device supported and prestressed between one of the oppositely facing axially spaced-apart guide pads and the shoe web, urging the web against another of the guide pads to thereby preload the web between the guide pads to inhibit shifting of the shoe;

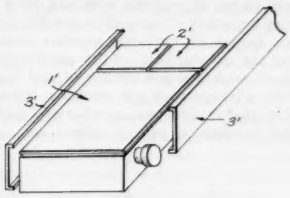
said hold-down device being a leaf spring having a central body portion carried on said one guide pad and laterally projecting arms having free ends prestressed against the web.

3,869,028
DOLLY USING A WARM-KEPT BATTERY AS ITS DRIVING POWER SOURCE

Yuji Sawada; Katsumi Takemoto, and Yasuro Maruoka, all of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1973, Ser. No. 412,139
Claims priority, application Japan, Nov. 2, 1972, 47-12702
Int. Cl. B60m *1/34*
U.S. Cl. 191—1 R **1 Claim**

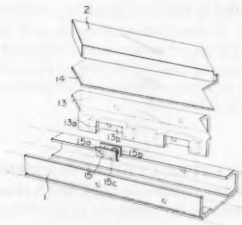
1. A dolly using a warm-kept battery as its driving power source, which comprises a member for loading thereon an article to be conveyed and a shoe for feeding a required electric power from a trolley, and which is adapted to run along equipped rails for conveying said article; characterized in that said dolly is provided with a battery serving as a driving power source for said dolly which battery is covered by a heat insulating material and includes a heater associated with a thermostat and heated by an electric power fed from said trolley through said shoe, and plug portions which can be detachably engaged with members for forcibly discharging hydrogen gas produced upon charging said battery.



3,869,029
SLIDING SHOE IN VEHICULAR PANTAGRAPH COLLECTOR

Shibayama Kunio, Kawasaki, Japan, assignor to Fuji Denki Seizo Kabushiki Kaisha, Kanagawa-ken, Japan

Filed Oct. 5, 1973, Ser. No. 403,887
Claims priority, application Japan, Oct. 6, 1972, 47-10051
Int. Cl. B60l *5/38*
U.S. Cl. 191—49 **5 Claims**



1. A sliding shoe in a pantagraph collector which comprises

a. a plurality of pan-plate pieces disposed in abutting end-to-end relationship in a row for following a power supply line;

b. a plurality of pan-plate supporting pieces disposed in abutting end-to-end relationship in a row corresponding to the pan-plate pieces, for supporting the latter respectively, the pan-plate supporting pieces being connected to the pan-plate pieces thereby forming assemblies respectively,

c. a sliding shoe frame for accommodating the assemblies, and

d. a plurality of elastic connecting means for elastically supporting the assemblies on the sliding shoe frame.

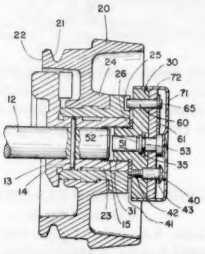
3,869,030
SEWING MACHINE CLUTCH

Noriyasu Masaki, Osaka, Japan, assignor to The Soryu Sewing Machine Mfg. Co., Ltd., Osaka, Japan

Filed Jan. 17, 1974, Ser. No. 434,056
Int. Cl. F16d *11/04*
U.S. Cl. 192—67 R **10 Claims**

1. A push-pull clutch for use in a sewing machine for selectively effecting rotation of a rotary drive shaft in the sewing machine, said clutch comprising a base member in driving relationship with one end of said drive shaft and rotatable therewith; a drive member coaxially mounted on said drive shaft and freely rotatable relative thereto, said drive member haivng a boss portion carrying a plurality of circumferentially spaced and axially extending pockets therein; a spline type

washer disposed between said base member and said boss and having at least one inwardly extending key engageable in a cooperating notch provided in the end of said drive shaft, whereby said washer is rotatable with said drive shaft, said washer having a plurality of outwardly extending circumferentially spaced splines; an operating member carried by said base member and movable between first and second operating positions in an axial direction relative to said boss and said base member; a transmission pin extending through aligned apertures provided in said base member and said operating member and between a pair of splines on said washer,



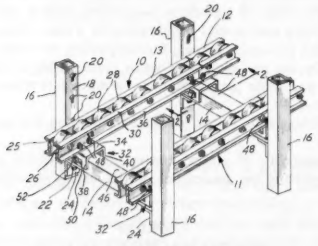
whereby rotation of said operating member effects rotation of said base member and said washer and said drive shaft; and a drive pin carried by said operating member and axially movable therewith relative to said base member and said boss, said drive pin being spaced from said boss when said operating member is pulled to said first operating position, whereby said drive member is rotatable relative to said drive shaft, said drive pin being engaged within one of said pockets in said boss when said operating member is pushed into said second operating position whereby rotation of said drive member effects rotation of said drive shaft.

3,869,031

STRUCTURE LEVELLING ASSEMBLY

Bestor P. Coleman, Willow Springs, and Kennedy McConnell, Riverdale, both of Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed Apr. 4, 1973, Ser. No. 347,810
Int. Cl. F16c *25/00;* **B65g** *39/02, 13/00*
U.S. Cl. 193—35 R **11 Claims**



1. An adjustable levelling assembly comprising,

a U-shaped rigid bracket member having a substantially flat support surface and a pair of flanges extending from opposite edges of said support surface, said flanges being spaced from each other such that they are adapted to receive first frame means therebetween,

a plurality of first apertures extending through said support surface, first fastener means extending through said first apertures into a location between said pair of flanges such that they may contact the first frame means, said first fastener means selectively adjusting the distance between said support surface and the first frame means in response to the length of said first fastener means extending through said first apertures, said first fastener means also being adapted to fasten second frame means which are to be levelled to said surface, and

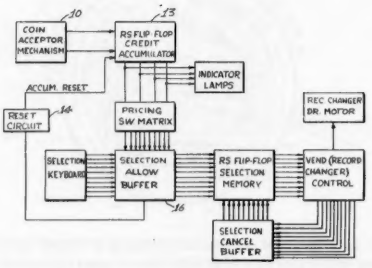
second apertures in said pair of flanges adapted to receive second fastener means therethrough for fastening said U-shaped rigid bracket member to said first frame means, said second apertures being shaped to allow adjustment of said bracket member in at least one of two directions perpendicular to each other as said length of said first fastener means is being adjusted.

3,869,032

SOLID STATE MONETARY ACCUMULATOR, CREDIT STORAGE, AND SELECTOR LOGIC CIRCUIT

Robert W. Wheelwright, Tonawanda, and William V. Machanian, Lewiston, both of N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed Dec. 29, 1972, Ser. No. 319,221
Int. Cl. G11b *19/08*
U.S. Cl. 194—1 N **3 Claims**



1. A monetary accumulator, credit storage, and selector logic circuit comprising, first circuit means for providing logic pulse signals which correspond to the value of coins sensed thereby, a plurality of memory circuits having inputs coupled to said first circuit means, said memory circuits providing discrete output terminals each corresponding to a different total accumulation of coins as registered by said first circuit means, each of the said output terminals arranged for connection to selector means to enable said selector means so that selections can be made corresponding to the total accumulation of coins as represented at the output terminal so energized, each of said plurality of memory circuit is formed by first and second cross-coupled logic circuits, each having a pair of inputs, one input of said first logic circuit being coupled to said first circuit means, one input of said second logic circuit being coupled to a second circuit means, and the output terminals of each of said first and second logic circuits being cross-coupled back to the other input of the othe. of said first and second logic circuits, to form an R-S flip-flop circuit, a capacitor connected between the output terminals of each of said logic circuits and ground potential, and said second circuit means being connected to said plurality of memory circuit and arranged for connection to said selector means to provide a reset signal to said plurality of memory circuits upon actuation of any one of the selector means.

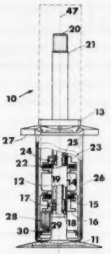
3,869,033
MULTIPLEX TYPEWRITER FOR TECHNICAL DRAWINGS

Borislav S. Ivanov, and Raina V. Ivanova, P.O. Box 145, both of Toronto, Ontario, Canada (M6P3J5)

Continuation-in-part of Ser. No. 217,442, Jan. 13, 1972, abandoned. This application July 30, 1973, Ser. No. 383,633

Int. Cl. B41j *19/16*

U.S. Cl. 197—10 **13 Claims**



1. A multiplex typewriter for technical drawings having typing element faces of each typing head or set of typing keys provided with one standard size letters and numerals in standard technical style as fixed by the National Standards for Lettering Technical Drawings, said letters and numerals representing elements for lettering said drawings, a tubular vertical stationary column supported by a column base, a common cylindrical platen mounted on the column for longitudinal and rotative sliding movements in drive mode and step mode variants about its own axis, operator-controlled vertical-movement step motor means mounted on the upper end of the tubular column, mechanical means operatively connecting the step motor to the platen to move it longitudinally of the said axis, operator-controlled rotating-movement step motor means operatively connected with the platen for rotating it about the axis, and a plurality of typing mechanisms mounted around the common cylindrical platen on a stationary table, said table being supported by a housing connected with the base of the column.

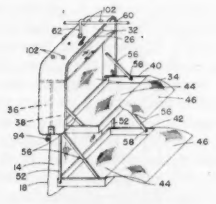
3,869,034
WARDROBE APPAREL CASE

Henry M. Thornton, Jr., Wyndham Dr., York, Pa. 17404

Filed Jan. 29, 1973, Ser. No. 327,843

Int. Cl. A47b *61/02, 61/06*

U.S. Cl. 190—13 R **11 Claims**



1. A suitcase for carrying wearing apparel and the like comprising in combination, a substantially U-shaped frame having longitudinally extending end panels and a connecting supporting panel adapted when in one arrangement to be carried by a handle and when in a second arrangement to be suspended from overhead means, a dividing partition extending between said end panels intermediately of the outer side edges thereof and perpendicular to said connecting supporting panel and said end panels to provide a pair of compartments in longitudinal back-to-back relationship, one or more tray-like members each having a bottom panel, pivot means connecting said tray-like member or members to said end panels of said frame in one of said compartments for movement between a compact folded position relative to said frame when said U-shaped frame is arranged to be carried and an outwardly extended substantially horizontal open position when said U-shaped frame is suspended to provide convenient access to apparel contained in said member or members, suspending means connected between said tray-like member or members and said end panels of said U-shaped frame and adapted to maintain said tray-like member or members in said substantially horizontal open position relative to said frame when the latter is suspended as aforesaid, and said other compartment comprising a wardrobe compartment.

3,869,035
APPARATUS FOR ALTERNATELY TRANSFERRING GROUPS OF CIGARETTES TO A ROTARY MAGAZINE VIA INTERMEDIATE RECIPROCATING CHAMBERS

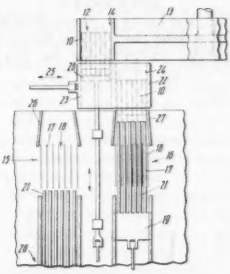
Heinz Hermann Focke, Siemensstr. 10, Verden/Aller, Germany

Filed Jan. 26, 1973, Ser. No. 326,702

Claims priority, application Germany, Jan. 29, 1972, 2204268

Int. Cl. B65g *47/04*

U.S. Cl. 198—24 **7 Claims**



1. An apparatus for supplying groups of cigarettes to a cigarette packing machine, comprising:

a. a pair of adjacent cigarette feed hoppers having spaced discharge ends,

b. an intermediate receptacle having two adjacent chambers open at both ends in an axial direction, said receptacle being reciprocable back and forth across the discharge ends of the feed hoppers,

c. a rotary magazine positioned adjacent the intermediate receptacle and having a plurality of pockets around the periphery thereof open in an axial direction,

d. the relative positioning between the discharge ends of the feed hoppers, the intermediate receptacle and the rotary magazine being such that at each end of the reciprocating travel of the intermediate receptacle one of its chambers is aligned with the discharge end of a feed hopper in receiving relation thereto while the other chamber is aligned with a pocket of the rotary magazine in discharge relation thereto,

e. the intermediate receptacle further comprising means for compressing together a group of cigarettes in a chamber of the intermediate receptacle during the movement of such chamber from a position of alignment with the discharge end of one of the feed hoppers to a position of alignment with a rotary magazine pocket, said compressing means comprising two generally parallel members each having a pair of adjacent, chamber defining indentations on the facing sides of such members, and parallel linkage means pivotally mounted between and intercon-

necting the members, whereby the relative movement of the members in a first direction serves to contract the chambers defined therebetween in both height and width while such relative movement in a second, opposite direction serves to open the chambers,

f. a pair of slide ejection members alternately reciprocable in phase opposition for pushing a group of a fixed number of cigarettes from the discharge end of a feed hopper into an aligned chamber of the intermediate receptacle,

g. the reciprocating motion of the intermediate receptacle being in a direction perpendicular to that of the slide ejection members, and

h. a push rod positioned between the slide ejection members and reciprocable in parallel synchronism therewith at twice the cycle rate thereof for pushing a group of cigarettes from one of the chambers of the intermediate receptacle into an aligned pocket of the rotary magazine,

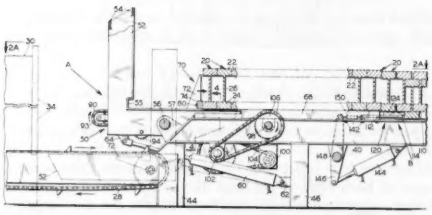
i. whereby while a group of cigarettes is being transferred from one of the feed hoppers to one of the intermediate receptacle chambers another group of cigarettes previously transferred from the other feed hopper to the other intermediate receptacle chamber is being loaded, by the push rod, into a pocket of the rotary magazine.

3,869,036

I BEAM NESTING AND STACKING METHOD AND APPARATUS

Charles W. Peters, and Larry K. Ebert, both of Eugene, Oreg., assignors to Trus Joist Corporation, Boise, Idaho

Filed Apr. 20, 1973, Ser. No. 352,879
Int. Cl. B65g *57/16*
U.S. Cl. 198—35 **21 Claims**



1. The method for nesting I beams comprising top and bottom chords and a connecting web, the method comprising:

a. arranging a plurality of I beams in side by side substantially aligned relation to each other,

b. advancing the I beams laterally,

c. shifting the first or leading I beam edgewise until its component chords lie on a different plane than do the chords of the second I beam,

d. advancing the second I beam laterally relative to the said first I beam until the leading portions of its chords lap the trailing portions of the chords of the first I beam, and

e. advancing laterally the third I beam relative to the second I beam in the plane of the first I beam until the leading portions of its chords lap the trailing portions of the chords of the second I beam, thereby arranging the I beams in nested relationship to each other.

3,869,037

FERROUS ALLOY AND ABRASIVE RESISTANT ARTICLES MADE THEREFROM

Richard J. Henry, Latrobe, and Robert A. Cary, Greensburg, both of Pa., assignors to Teledyne Mid-America Corporation, Los Angeles, Calif.

Filed Mar. 12, 1973, Ser. No. 339,656
Int. Cl. C22c *39/14, 39/26, 39/54*
U.S. Cl. 198—37 **12 Claims**

1. A ferrous alloy steel having the following chemical analysis:

Ingredients	Percent by Weight
Carbon	2.2–3.5
Chromium	2.5–5.0
Vanadium	6.0–10.0
Molybdenum	1.5–3.0
Silicon	0 –1.0
Sulfur	0 –0.03
Tungsten	0 –1.0
Nickel	0 –3.0
Phosphorus	0 –0.03
Manganese	0 –1.0
Cobalt	0 –5.0

the remainder consisting essentially of iron, the relationship between carbon and vanadium being determined by the equation:

$$C = 1.25 + 0.236\ [V_B - [0.7 + 0.18(V_B - 0.7)]]$$

where C is carbon, V_B is the level of vanadium within the range of 6.0 to 10.0% and $[0.7 + 0.18(V_B - 0.7)]$ is the amount of vanadium dissolved in the steel matrix, said composition capable of being forged, austenitized, quenched and tempered to produce a substantially tempered martensitic structure which shows a hardness of about 59-67 Rockwell "C" and a grindability index not exceeding approximately 0.3.

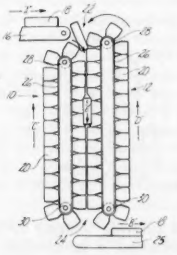
7. An abrasion resistant article formed by forging, austenitizing, quenching and tempering a ferrous alloy steel having a composition as claimed in claim **1**, said article having a substantially martensitic structure, a Rockwell "C" hardness within the range of 59 to 67 and a grindability index not exceeding approximately .3.

3,869,038

ARTICLE CONVEYING APPARATUS

Robert J. Piper, Detroit, and Frank K. Locke, Hudson, both of Mich., assignors to Stearns Manufacturing Co. Inc., Flat Rock, Mich.

Filed Aug. 9, 1973, Ser. No. 386,941
Int. Cl. B65g *15/14*
U.S. Cl. 198—165 **10 Claims**



1. In combination with an endless conveying apparatus of the type wherein a plurality of resilient flexible article engaging members engage an article to be conveyed, and wherein the resilient flexible article engaging members are connected to two parallel spaced continuous chain members disposed along opposite longitudinal sides of the apparatus and trained

about head chain sprockets and tail chains sprockets, the improvement which comprises:

a pair of hinges comprising a first hinge and a second hinge connecting each article engaging member to the continuous chain members;

said first hinge connecting a leading edge of said article engaging member to each of the continuous chain members, the pivotal axis of said first hinge being generally transverse to the direction of movement of said continuous chain members,

said second hinge connecting a trailing edge of said article engaging members to each of the continuous chain members, the pivotal axis of said second hinge being generally transverse to the continuous chain members, and

said first hinge and said second hinge each comprising an elongated tubular member connected to said article engaging member, a mounting rod slidably receivable in said elongated tubular member thereby being mounted on said mounting rod for rotational movement about the longitudinal axis of said mounting rod;

means to removably mount opposite ends of said mounting rod to different ones of the two parallel continuous chain members, and

means to connect one end of said mounting rod to one of the continuous chain members to prevent axial movement of said mounting rod.

3,869,039

SCRAPER ASSEMBLIES FOR SCRAPER CHAIN CONVEYORS

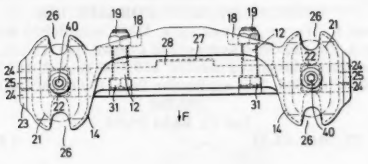
Helmut Temme, Waltrop, and Oscar Kohler, Lunen-Sud, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Westfalia, Germany

Filed May 8, 1973, Ser. No. 358,230

Claims priority, application Germany, May 18, 1972, 2224322

Int. Cl. B65g *19/00*

U.S. Cl. 198—175 **7 Claims**



1. a scraper assembly for use with scraper chain conveyors; said assembly consisting of a first one-piece component provided with a main body and shaped end portions and a second one piece component provided with a main body and end portions; the end portions of the first component each having grooves, which are curvilinear in plan view, on its undersurface for locating over an oval horizontal link of one of two spaced-apart chains, a depending spigot disposed between the grooves which projects into said horizontal link and vertical apertures at its front and rear sides which locate vertical links of the chain adjoining said horizontal link, the main body of the first component having an upstanding web and a widened head piece which projects over the main body of the second component and the end portions of the second component each having grooves, which are rectilinear in plan view, on its upper surface for locating under one of said horizontal links, the end portions of the first and second components being provided with a plurality of interengageable projections and recesses and the main bodies of the components having a centrally located interengageable projections and recesses and bores for receiving fixing means for securing the components together.

3,869,040

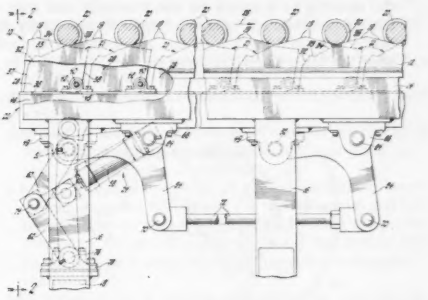
CONVEYOR FOR CYLINDRICAL PARTS

Daniel L. Rice, Lapeer, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 7, 1973, Ser. No. 357,950

Int. Cl. B65g *25/04*

U.S. Cl. 198—219 **3 Claims**



1. A conveyor for moving cylindrical parts is a direction substantially perpendicular to the longitudinal axes of said parts, said conveyor having an entrance end for receiving cylindrical parts and an exit end from which said cylindrical parts are removed and comprising a pair of laterally spaced support plates, a series of equally spaced and uniform notches formed in the upper portion of each of said support plates for supporting and spacing said cylindrical parts, a plurality of identically formed positioning members located between said support plates, the upper portion of each of said positioning members comprising first, second, third, and fourth angularly related surfaces for cooperation with said notches for controlling and guiding successive movement of the cylindrical parts from one notch to the next notch from the entrance end to the exit end of the conveyor, said first, second, third and fourth surfaces being arranged consecutively on each positioning member from the entrance end to the exit end and having the first and third surface inclined downwardly towards the entrance end and the second and fourth surfaces inclined downwardly toward the exit end, and means supporting each of the positioning members adjacent one of said notches so when each of the notches is filled with a cylindrical part upward and then downward movement of the positioning members relative to the support plates causes the cylindrical parts to be removed from the notches by the first and fourth surfaces of each adjacent pair of positioning members and returned to the same notches from which the cylindrical parts were removed, but when one of said notches is empty upward and then downward movement of the positioning members causes the cylindrical parts preceding the empty notch to be cammed by the fourth surface of one positioning member onto the second surface of the adjacent positioning member and deposited thereby in the associated notch.

3,869,041

MACHINE FOR SEED CELLING PREVIOUSLY CORED APPLES

Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Division of Ser. No. 283,919, Aug. 25, 1972,. This application Nov. 21, 1973, Ser. No. 417,725

Int. Cl. B65g *47/24*

U.S. Cl. 198—259 **5 Claims**

1. In an apparatus for removing the seed cell from a previously cored apple including:

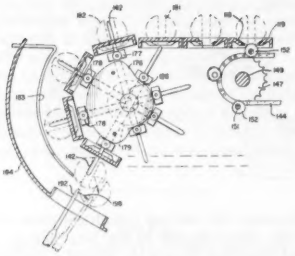
a. a conveyor having a plurality of cavities therein, each cavity being conical in shape and having an opening on the underside,

b. the conveyor being movable over a path having upper and lower horizontal runs connected by a semicircular run at each end,

c. a rotatable support provided within one of the semicircular runs of the conveyor,

d. a plurality of first pins slidably mounted on the rotatable support and extending radially from the support,

e. means for moving each of the first pins first to project into the opening in a cavity on the conveyor and then to extend into the core hole in an apple in said cavity and finally to be withdrawn from said core hole and the cavity after the apple has fallen down the first pin,



f. a curved plate having a curvature on a radius extending from the center of one of the semicircular runs of the conveyor to engage and support an apple on a first pin as the pin approaches a transfer point at the lower end of the semicircular run,

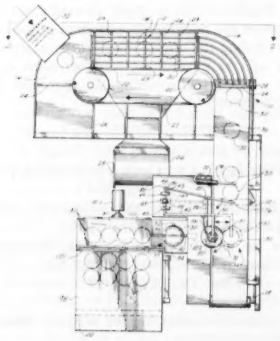
g. and a second pin movable over a path to follow the first pin at said transfer point to enter the core hole in an apple on the first pin and engage the apple as the apple falls down the first pin after which the first pin is withdrawn from the apple.

3,869,042

INSPECTING AND STACKING MACHINE FOR CONTAINERS

Wallace C. Floyd, 1110 S. 10th St., Arcadia, Calif. 91006, and Gregory W. Holcomb, 1930 N. Cambridge, Orange, Calif. 92667

Filed Aug. 25, 1972, Ser. No. 283,746
Int. Cl. B65g *47/24*
U.S. Cl. 198—267 **10 Claims**



1. Apparatus for orienting a supply of randomly positioned, tapered, bottom-heavy containers coming from a delivery source, the apparatus comprising:

an orientation station for receiving and orienting said randomly-positioned containers, the orientation station including an elongated support surface for confining downward movement of the containers to be moved along the length of the support surface,

a gas supply and means for directing the flow of gas from the gas supply to the underside of said support surface,

the support surface having spaced apart openings to allow the gas to flow upwardly through it,

means forming a series of spaced apart compartments movable above the support surface and along the length thereof from a front portion of the orientation station in the vicinity of the delivery source to an end portion of the orientation station so that containers admitted to the compartment means from the delivery source can be moved by the compartment means along the support surface, each compartment means forming an enclosure extending around a given randomly-positioned container coming from the delivery source, each enclosure being open at its bottom and at its top so that gas from the gas supply can flow upwardly through the enclosure, and

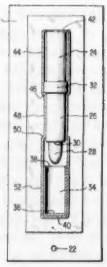
means generating a laminar flow of the gas through the support surface and the movable compartment means being in a direction substantially opposed to that of normal gravitational attraction and at an adjustable sufficient flow rate that the gas flows upwardly against substantially the entire randomly-positioned, downwardly-facing surface area of each container, and around, and past each container and so that the gas flow will orient each container in a substantially upright position within its respective compartment means, the moving compartment means cooperating with the gas flow to transfer the containers toward the end portion of the orientation station as the containers are being oriented by the laminar gas flow so that the containers are oriented in an upright position within their respective compartment means when they reach the end of the orientation station.

3,869,043

DISPLAY PACKAGE FOR LIPSTICK

Ronald C. Warner, Ottawa Lake, Mich., and Bobby R. Shepherd, Toledo, Ohio, assignors to Cameo, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 277,164, Aug. 2, 1972, Pat. No. 3,762,545. This application Sept. 17, 1973, Ser. No. 398,208
Int. Cl. B65d *25/00*
U.S. Cl. 206—45.31 **7 Claims**



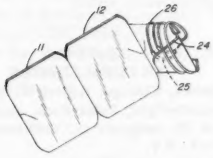
1. A display package which permits selective visual observation of the color of a product contained therein, said display package comprising:

a backing sheet;

a transparent cover sheet overlying at least the central portion of said backing sheet;

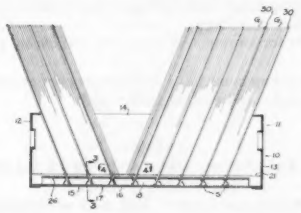
said transparent cover sheet having a portion spaced away from said backing sheet to form a raised blister;
chamber means formed between said backing sheet and said raised blister;
said product being disposed within said chamber means and including:
a first opaque section having a colored portion adjacent an end thereof, and
a second opaque section which fits over the colored portion and the end of said first opaque section to prevent visual observation of said colored portion;
said first and second opaque sections having a combined axial length which is less than the axial length of said chamber means;
said raised blister being engaged with one of said opaque sections to prevent axial movement thereof within said chamber means;
said raised blister forming a guide for the other of said opaque sections to permit it to slide axially within said chamber means to move toward and away from said one opaque sections;
said display package being selectively and manually movable between a display position and an inverted position; said other opaque section being gravitationally moved by axial sliding within said chamber means, when said display package is manually moved to said display position, until said second opaque section fits over the colored portion and the end of said first opaque section to cover said colored portion and to prevent visual observation thereof;
said other opaque section being gravitationally moved by axial sliding within said chamber means, when said display package is manually moved to said inverted position, until said second opaque section is spaced away from the colored portion and the end of said first opaque section to expose said colored portion and to permit visual observation thereof through said raised blister.

3,869,044
REEL-LABEL FOR SMALL DIAMETER SUTURES
David Lawrence Olsson, Pearl River, N.Y., and Sol Singerman, E. Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed Aug. 8, 1973, Ser. No. 386,662
Int. Cl. A61l *17/02*; **B65d** *73/00*; **B65h** *55/00*
U.S. Cl. 206—63.3 **1 Claim**



1. A surgical suture package comprising a sealed, sterile envelope having therein in sterile configuration a needled surgical suture on a reel-label, wherein the improvement comprises:
a one piece six panel reel-label of stiff sterilizable label stock consisting essentially of
a bottom fold panel,
a pocket panel,
a top fold panel,
a reel panel,
a rear panel, and
a face panel,
said bottom fold panel being short and attached to the bottom of said pocket panel, and folded along a score line to enclose the bottom of said reel panel,
said pocket panel being smaller than and attached to one side of said reel panel, and folded and held thereagainst by said bottom fold panel to form a needle pocket,
said top fold panel being short and attached to the top of the reel panel, and folded against the reel panel,
said back panel being attached to, larger than, and folded against the reel panel and needle holding pocket,
said face panel being attached to, essentially the same size as, and folded towards the rear panel to enclose therebetween the reel panel, pocket panel, and top and bottom fold panels,
said face panel having a diagonal cut therein to form a holding tongue,
said rear panel having a second diagonal cut therein to form a holding slit,
said holding tongue and holding slit being in interengaging relationship to hold the face panel and rear panel adjacent, and releasably closed, and
a surgical suture having a surgical needle attached thereto wound about the reel panel, the top fold panel and bottom fold panel, with the needle enclosed in the pocket formed by the pocket panel, reel panel, and bottom fold panel, thus protecting the suture from the armed edges of the needle,
said reel-label being particularly adapted for very fine sutures, by having the suture wrapped over folded rather than cut edges.

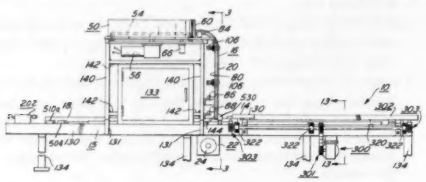
3,869,045
POSTING TRAYS
Joseph D. Lear, Snyder, N.Y., assignor to Posting Equipment Corporation, Buffalo, N.Y.
Filed May 30, 1972, Ser. No. 247,602
Int. Cl. B42f *17/12*
U.S. Cl. 211—11 **1 Claim**



1. A posting tray of open box formation comprising a longitudinally extending bottom with a centrally disposed downwardly extending first channel extending longitudinally thereof, said channel having vertically spaced legs with a transverse horizontal leg extending between said vertical legs, a second inner central channel disposed within said first channel with a horizontal leg extending between vertical legs with said second channel vertical legs being spaced inwardly of said first channel vertical legs and being secured at their lower edges to the transverse leg of said first channel, and pivot slots having elongated transverse horizontal (slots) slot portions disposed in said second inner channel horizontal leg and extending inwardly of said inner channel vertical legs, and (angular slots) vertical slot portions disposed in said inner channel vertical legs, and (said) angular slots intersecting said (horizontal slots) vertical slot portions and having lower upwardly converging portions, and middle portions with horizontal walls extending toward each other to form a catch thereon, at the intersection with said vertical slot portions (and upper portions with vertical walls entering said horizontal slots,) a plurality of rectangular tilt plates in said tray each having a pair of spaced rectangular tabs extending from its lower margin with each plate having its spaced tabs disposed transversely in said horizontal (slots) slot portions and said tabs

having encircled openings therein positioned to be in transverse and longitudinal alignment with said angular slots and extending inwardly and outwardly thereof, to register therewith to permit said horizontal walls of said angular slots to extend into said openings to lock said plates therein when said plates are disposed angularly with a vertical plane.

3,869,046
AUTOMATIC CORE LOADER
James P. Gerhart, 1506 Pheasant Dr., Warminster, Pa. 18974
Filed June 6, 1973, Ser. No. 367,526
Int. Cl. B21c *47/28*
U.S. Cl. 214—1 R **18 Claims**



1. An automatic core loader for a plurality of cores comprising

a core box,

said core box including spatial support means for aligning said cores concentrically to each other and along the longitudinal axis of said core box,

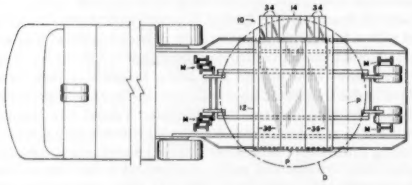
a mandrel upon which said cores are to be spatially placed, support and motive means for advancing said core box along the longitudinal axis of said mandrel and concentrically therewith so as to spatially place said cores along the outer surface of said mandrel, and

means for supplying cores to said core box, said means for supplying cores while said core box is advancing to said core box comprises

a hopper for storing said cores and dispensing said cores, and

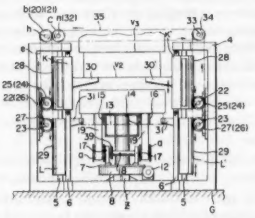
a chute in communication with said hopper at one end and with said core box at the other end.

3,869,047
LOAD EXTENDING MECHANISM FOR MATERIAL HANDLING VEHICLE
Derek K. Keene, and Louis C. Roll, both of Philadelphia, Pa., assignors to Eaton Corporation, Cleveland, Ohio
Filed Feb. 1, 1974, Ser. No. 438,815
Int. Cl. B66f *9/14*
U.S. Cl. 214—1 BB **8 Claims**



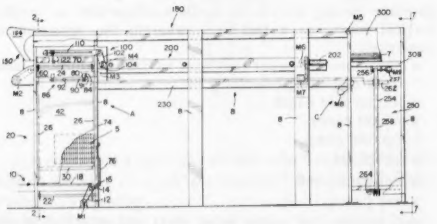
1. Material handling apparatus for handling a load including a platform rotatable about a vertical axis, a load supporting shuttle mounted on said platform for extension and retraction relative thereto, first drive means operable to extend and retract said shuttle, a secondary load supporting member mounted on said shuttle for extention and retraction relative to said shuttle, and second drive means operable to extend and retract said secondary load supporting member, said first and second drive means being interconnected for simultaneous operation and said second drive means including a lost motion connection with said secondary load supporting member, whereby initial extension of said secondary load supporting member relative to said shuttle lags extension of said shuttle by a predetermined travel distance and full retraction of said shuttle lags full retraction of said secondary load supporting member by a predetermined travel distance whereby said load, shuttle and secondary member are shiftable from a fully retracted position to a position which allows them to rotate within a minimum swing radius.

3,869,048
APPARATUS FOR HANDLING BAKING PANS
Katsushi Takahashi, No. 1021 Miyato, Asaka-shi, Saitama-ken, Japan
Filed June 30, 1972, Ser. No. 268,074
Claims priority, application Japan, July 13, 1971, 46-60847
Int. Cl. B65g *59/06*
U.S. Cl. 214—8.5 A **2 Claims**



1. An apparatus for handling baking pans to separate each baking pan from a stack of rectangular baking pans piled up with a major axis of each pan placed perpendicularly to that of an adjoining pan, comprising a turn table mechanism provided with a conveyor belt and a pan receiving disc interposed between a loading conveyor line and an unloading conveyor line for said stack of baking pans, vertical guide posts secured to the machine frame at the each corner outside of the said turn table mechanism, the first and second elevator means slidably mounted respectively on said vertical guide posts and horizontal hook members projecting integrally from each of said first and second elevator means, said first and second elevator means being operated independently from each other by means by photoelectric means.

3,869,049
CAN DEPALLETIZER
Jerome A. Selusnik, Chicago; Robert W. Wolfe, Oak Lawn; William J. Cartwright, Palos Park, and Oliver C. Tate, Darien, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed May 29, 1973, Ser. No. 364,591
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 A **10 Claims**



1. A container handling apparatus for unloading containers

stacked in tiers separated by paperboard upon a pallet, said apparatus comprising:

a. elevator means for receiving a loaded pallet, and for incrementally raising said pallet;

b. separate discharge means adjacent the top of said elevator means for removing said containers, paperboard and pallet from said elevator means; and

c. three horizontal conveyor means exending from the top of said elevator means for receiving said containers, paperboard and pallets and conveying same to separate collecting areas.

3,869,050

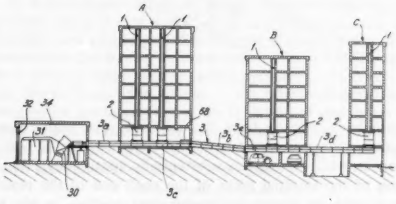
REFUSE COLLECTING APPARATUS

Jean-Claude Michel, Saint-Maur-des-Fosses, France, assignor to Societe Industrielle de Transports Automobiles (Societe Anonyme), Paris, France

Filed Oct. 30, 1973, Ser. No. 411,065

Int. Cl. B66c *5/02*

U.S. Cl. 214—16 R **22 Claims**



1. Apparatus for collecting refuse in a residential estate with multistorey buildings, wherein each said building has a refuse chute column, a collecting receptacle in which said column terminates at a low level thereof, at least one collecting vehicle for serving the collecting receptacles of all the buildings, a hollow casing situated underneath the said collecting receptacles and formed so as to provide a service path for said at least one vehicle, and a discharge along said service path, there being a general displaceable collecting receptacle at said discharge station.

3,869,051

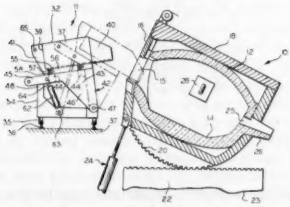
FURNACE CHARGING APPARATUS

Stanley T. Sczerba, McKeesport, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed May 4, 1973, Ser. No. 357,507

Int. Cl. F27b *3/18*

U.S. Cl. 214—18 SC **5 Claims**



1. The apparatus for charging a metallurgical vessel which has at least one charging opening for receiving material, said apparatus comprising:

transport means,

container means for receiving material which is to be charged into said vessel,

said transport means being constructed and arranged for being positioned adjacent said vessel to dispose said container means adjacent said vessel opening,

frame means pivotally mounted on said transport means, said frame means including a first elongate frame portion extending generally vertically and being pivotally connected adjacent its lower end to said transport means on the side of said transport means adjacent said vessel, the pivotal axis of said first frame portion lying a substantial distance below said opening and extending in a direction generally parallel to said opening,

said frame means also including a second frame portion affixed adjacent the upper end of said first frame portion and extending over said transport means in a direction generally away from said opening, container means mounted on the second portion of said frame means,

operator means coupled to said second frame portion and operative to tilt said frame means about said pivotal axis and toward said vessel opening,

said container means having an open discharge end disposed generally above the junction of said first and second portions, the pivotal movement of said frame means moving the open end of said container means a substantial distance toward said vessel and into said opening and tilting the opposite end of said container upwardly for discharging the contents thereof into said opening.

3,869,052

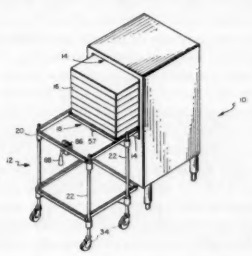
TRUCK FOR LOADING OVEN COMPARTMENTS

Richard M. Leahy, Malden, Mass., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Sept. 14, 1973, Ser. No. 397,357

Int. Cl. B60p *1/64*

U.S. Cl. 214—38 B **4 Claims**



1. The combination with a compartment having a front wall with an opening providing access to the interior for receiving a dolly, a mobile truck movable to a position confronting the front opening of the compartment, said truck comprising a shelf mounted thereon for adjustment to a height corresponding to the compartment such that when the truck is moved to said confronting position a dolly mounted on the shelf may be rolled therefrom into the compartment, docking means on the truck interengageable with the opening in the compartment, and locking means for locking the truck to the compartment while transferring the dolly from the shelf on the truck to the compartment and vice versa characterized in that said locking means comprises a rigid rod rotatably supported at the underside of the shelf and extending from the front to the back with a hook at the front end for engagement with a slot in the wall and a handle at the rear end for effecting manipulation of the locking means, said rod having an eccentric portion intermediate its ends, a latch plate situated on the eccentric portion perpendicular to the axis thereof with a portion extending upwardly through the shelf, said upwardly extending portion containing an opening, a lug on the underside of the dolly at a level to enter the aperture when the latch plate is elevated and to be locked to the latch plate when the latter is lowered.

said eccentric portion of the rod being rotatable by manipulation of the handle to effect elevation and lowering of the latch plate, the disposition of the hook with respect to the eccentric portion of the rod being such that when the hook is engaged with the slot in the wall the latch plate is elevated and when the hook is disengaged from the slot in the wall the latch plate is lowered.

3,869,053

LOADING RIGID SHEET MATERIALS

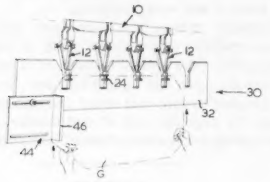
Roland E. Gilbank, Oshawa, Ontario, Canada, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 20, 1973, Ser. No. 381,224

Claims priority, application Canada, Apr. 4, 1973, 167959

Int. Cl. B65g *67/04*

U.S. Cl. 214—41 **8 Claims**



1. Apparatus for assisting the loading of a rigid sheet into substantially simultaneous gripping engagement with a plurality of freely suspended self-closing tongs spaced apart along a given surface comprising tong pivotal motion limiting means adapted for positioning sufficiently close to the position occupied by each of said self-closing tongs when the latter are freely suspended and constructed and arranged to simultaneously limit the amount of pivotal movement of each of said freely suspended tongs in directions having components both normal to and parallel to said given surface and movement guide means associated with the tong pivotal motion limiting means to guide the movement of an upper portion of the rigid sheet in an upward direction along said given surface and arranged such that upward movement of the rigid sheet along said movement guide means brings said upper sheet portion into contact with the self-closing tongs to cause the tongs to open and receive said upper sheet portion, whereby said tongs remain in proper location or orientation relative to the rigid sheet and thereafter close to substantially simultaneously grip and support the sheet when a force on the sheet causing said upward movement is relieved.

3,869,054

BUCKET HAVING A MOBILE BACK

Rene V. Moreau, Ermenonville, France, assignor to Societe Anonyme: Poclain, Le Pleiss Belleville Oise, France

Filed Feb. 15, 1974, Ser. No. 443,030

Claims priority, application France, Mar. 21, 1973, 73.10167

Int. Cl. E02f *3/40*

U.S. Cl. 214—146 R **7 Claims**

1. Bucket having a mobile back comprising:

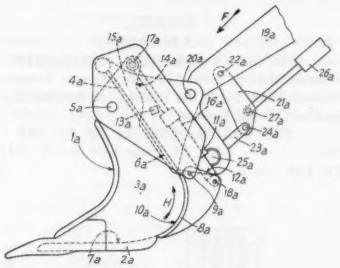
a shell,

the said mobile back, which is mounted to pivot on the said shell about an axis,

and a position adjustment organ, which is linked between the said back and the said shell to adjust their relative pivoting in at least two positions, in the first of which the said back bears against the shell and co-operates with the latter to form the complete bucket provided with a loading opening, and in the second of which this back is distant from the rear face of the shell on the side opposite to the loading opening relative to this shell, this rear face itself being opposite to the said loading opening, this rear face of the shell and the internal face of the said back in the second position defining therebetween a passage, in particular for evacuation of the material which may be contained in the shell, the back itself comprising

a main back which is mounted to pivot relative to the shell about the said axis,

and a connecting element which is arranged on the main back retractably relative to the internal face of the said



main back, remote from the said axis, and which can occupy two positions, one known as the connected position, in which it forms a substantially contiguous extension of the internal faces of the shell and of the main back, and one known as the retracted position, in which it is effectively retracted relative to the plane of the internal face of this main back, and a second position adjustment organ being linked between the said connecting element and one of the said shell and main back.

3,869,055

TRANSFER APPARATUS

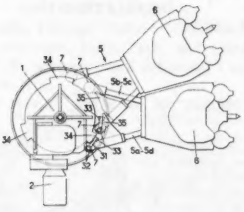
Henri Peltier, Chatillon; Pierre Chatourel, Chaville, and Roger Bailly, Meudon, all of France, assignors to Regie National des Usines Renault, Boulogne-Billancourt, France

Filed Sept. 4, 1973, Ser. No. 393,857

Claims priority, application France, Sept. 22, 1972, 72.33790

Int. Cl. B25j *11/00*

U.S. Cl. 214—151 **19 Claims**



1. An article transport apparatus comprising a pair of support tracks, drive means for driving one of said tracks at a slow speed and the other said track at a fast speed, an article carriage, first roller means mounted on said carriage and engaging said slow track, second roller means mounted on said carriage and engaging said fast track, said first and second roller means cooperating to support said carriage on said tracks, and braking means for braking said second roller means to thereby accelerate said carriage.

3,869,056

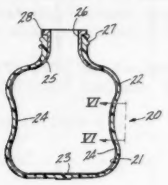
MULTILAYERED HOLLOW PLASTIC CONTAINER

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. Nos. 71,734, Sept. 14, 1970, Pat. No. 3,717,544, and Ser. No. 100,050, Dec. 21, 1971, Pat. No. 3,719,735. This application Dec. 26, 1972, Ser. No. 318,386

Int. Cl. B65d 23/08

U.S. Cl. 215—1 C 9 Claims



1. A multilayered hollow plastic container having a base portion, integral side walls and an integral open neck or rim portion, said container exhibiting the characteristics of blow orientation and having an inner drawn seamless thermoplastic layer and an outer solid seamless pressure molded layer, the two layers being adhered one to the other substantially over their entire contacting areas, the thickness of said layers at the neck or rim portion being greater than the thickness of said layers at the side walls, wherein the inner layer overlaps the outer layer at said neck or rim portion.

3,869,057

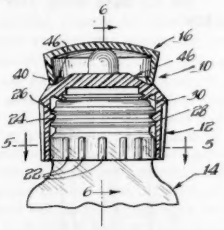
SAFETY CLOSURE DEVICE

Christian F. Miller, Palos Park, Ill., assignor to V.C.A. Corporation, Greenwich, Conn.

Filed Mar. 2, 1972, Ser. No. 231,337

Int. Cl. B65d 55/02

U.S. Cl. 215—216 8 Claims



1. A safety closure device for an open-ended container including a first section for telescopic association with a container in the vicinity of the open end thereof, means for securing said section against unauthorized axial separation with respect to a container, a second shiftable section in the form of a closure member hingedly coupled with said first section and adapted in one shifted position to cover and in another position to uncover said first section, and means providing an interference fit for detachably interlocking said first and second sections in closed position, said second section being sufficiently flexible to become distorted in shape independently of said first section in response to opposed pressures applied manually to opposite areas of the periphery thereof for releasing the interference fit between the first and second sections permitting the latter to be moved to open position, and the means for detachably interlocking said first and second sections comprising interlocking protuberances, the first section having oppositely disposed inclined surfaces adapted to be engaged by adjacent peripheral portions of the second section to cause elevation of said second section upon distortion thereof.

3,869,058

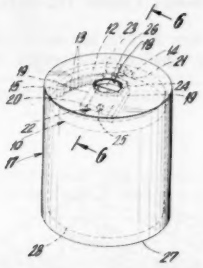
SAFETY CLOSURE FOR CONTAINERS

Clayton Bogert, 118 Lowell Rd., Glen Rock, N.J. 07452

Filed Jan. 26, 1973, Ser. No. 326,861

Int. Cl. B65d 55/02, 85/56; A61j 1/00

U.S. Cl. 215—219 5 Claims



1. A safety closure for containers comprising:
an inner cap having a top portion and a rim,
a tapered raised member on said top having relatively flat surfaces at each edge and notches between said flat surfaces extending inwardly from the rim of the inner cap,
spring means on the top portion of the inner cap,
an outer cap having a top portion,
tracks on the underside of the top portion of the outer cap forming a guideway,
an aperture in said outer cap,
a movable slide disposed in said guideway and maintained in the guideway by the action of said spring means, said movable slide when partially moved out of said guideway engaging the flat surfaces and notches on said raised member when the outer cap is rotated in one direction and then the other.

3,869,059

STOPPERS

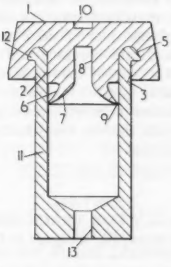
Gerard Ellis, Little Chalfont, England, assignor to Surgical Equipment Supplies Limited, London, England

Filed June 21, 1973, Ser. No. 372,498

Claims priority, application Great Britain, July 5, 1972, 31539/72

Int. Cl. B65d 41/28

U.S. Cl. 215—320 4 Claims



1. A stopper of rubber or rubber-like material suitable for use in in-bottle sterilization, comprising a body having an external generally cylindrical sealing surface for engaging the inside of the neck of a bottle, the body having an internal cavity extending inside the sealing surface and adapted to be exposed in use to the pressure within the bottle; and an integral flexible lip extending from said body to an edge substantially co-axial with said sealing surface for engaging the inside of the neck in substantial line contact, the configuration of said stopper being such that, in the unstressed state, the edge is of greater diameter than the sealing surface, and the lip has

an outer surface which is concave and an inner surface which merges into the cavity.

3,869,060

CONTAINER FOR RECEPTACLES

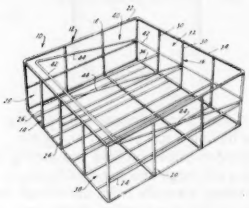
Esteban Jose Goyheneix, Urquiza 132, 10°G., Acassuso, Argentina

Filed Feb. 2, 1972, Ser. No. 222,899

Claims priority, application Argentina, Feb. 9, 1971, 233925

Int. Cl. B65d *7/20, 25/10, 25/06*

U.S. Cl. 220—19 **10 Claims**



1. A container for storing, transporting and distributing receptacles, which container is adapted to be filled and unfilled automatically and comprises, a parallelepiped frame having a floor and a plurality of lateral sides, said frame being open at its top side opposite said floor and defining a hollow chamber for containing receptacles, a plurality of divider members extending across said cavity between one pair of opposed frame sides and dividing said cavity into a plurality of internal channels extending between said pair of opposed frame sides; at least one of said frame sides having a plurality of openings therein corresponding in number to and aligned with the channels defined in said cavity, said openings extending from said floor to a position adjacent the top edge of said at least one side to permit receptacles to pass therethrough into said channels, and means positioned in said cavity adjacent said openings for selectively blocking and unblocking said openings whereby when said openings are unblocked, receptacles may pass therethrough into said channels and when said openings are blocked, receptacles in said channel are prevented from movement through said openings out of said cavity; each of said pair of sides having a plurality of openings therein; and said blocking and unblocking means comprising at least a pair of bars positioned adjacent said openings and extending parallel to said pair of sides, said bars resting upon said divider members and being adapted to move vertically with respect thereto for selectively blocking and unblocking said openings.

3,869,061

GUARD ASSEMBLY FOR TRACK DRIVE MOTORS

John C. Wanner, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 240,606, April 3, 1972, Pat. No. 3,797,598. This application Aug. 22, 1973, Ser. No. 390,347

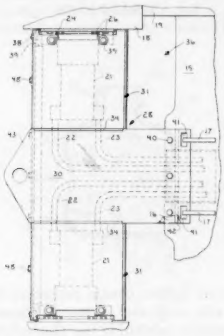
Int. Cl. B65d *43/16*

U.S. Cl. 220—334 **7 Claims**

1. A generally horizontally disposed guard assembly attached to a frame for protecting at least one motor or the like comprising

separable upper and lower covers, each having a first end and an opposite second end, detachably mounted on said frame, said lower cover comprising a heavy-duty steel plate construction and

hinge means pivotally attaching the first end of said lower cover on an underside of said frame for selectively permitting said lower cover to pivot thereabout whereby said



lower cover can be pivoted downwardly to expose the motor or the like protected thereby.

3,869,062

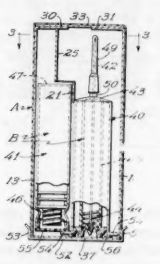
VIAL AND SYRINGE CARTON FOR EMERGENCY DRUGS

Harold R. Jaeschke, and Daniel J. Boyle, both of Milwaukee, Wis., assignors to Hoerner Waldorf Corporation, Ramsey, Minn.

Filed Sept. 24, 1973, Ser. No. 400,361

Int. Cl. B65d *79/00, 5/48*

U.S. Cl. 206—229 **5 Claims**



1. A syringe package for use with a syringe including an open ended cylinder having a hypodermic needle projecting coaxially therefrom and,

a plunger slidably adaptable in said cylinder, the plunger comprising a cylindrical body having a closed end and a plug of resilient material closing the other end of said plunger, said plunger containing the fluid to be dispensed, the cylinder including finger engaging ears adjoining the open end thereof, the package including:

a body including front, rear, and side walls connected in tubular relation.

top and bottom closures for said tubular body,

said body including the cylinder and plunger in side-by-side relation,

means in said carton body preventing slidable movement of said plunger in an axial direction,

an end of said plunger engaging one of said finger extending ears to prevent longitudinal movement of said cylinder supporting said projecting needle,

the open end of said cylinder substantially engaging said bottom closure.

3,869,063

EASY OPENING CLOSURE FOR CONTAINERS

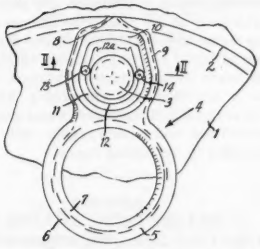
Kurt Himstedt, Braunschweig, Germany, assignor to Schmalbach-Lubeca-Werke Aktiengesellschaft, Braunschweig, Germany

Filed May 14, 1973, Ser. No. 360,010

Claims priority, application Germany, June 13, 1972, 7222042

Int. Cl. B65d *17/20*

U.S. Cl. 220—270 **9 Claims**



1. An easy opening closure for containers, said closure comprising a panel, at least one weakening line in said panel defining a displaceable panel portion, a pull tab for effecting the rupture of said panel along said weakening line and the displacement of said panel portion, means securing said pull tab to said panel portion with a part of said pull tab lying flatly against said panel portion, and interlocking means of the projection and socket type in said pull tab part and said panel portion for preventing rotational movement of said pull tab relative to said panel portion about said securing means, said interlocking means having the appearance of being simultaneously formed, said pull tab having a nose generally alignable with said weakening line and a grip portion, said nose and said grip portion being disposed on opposite sides of said securing means, and said interlocking means being disposed between a center of said securing means and said nose and projection being on said pull tab part and said socket being in said panel portion wherein said interlocking means are more forcibly engaged when said grip portion is moved away from said panel portion in a container opening operation.

3,869,064

MECHANICAL SOLD OUT FOR ROTARY SLANT SHELF

Harry R. Payne, Chattanooga, Tenn., assignor to Cavalier Corporation, Chattannoga, Tenn.

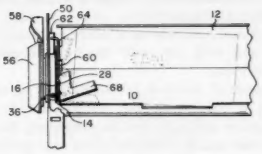
Filed Mar. 13, 1973, Ser. No. 340,672

Int. Cl. B65h *7/18*

U.S. Cl. 221—19 **6 Claims**

1. A vending machine of the type having a plurality of rotatable dispensing cradles, each adapted to support a single item to be dispensed, the improvement comprising, for each cradle,

a. a latch carried by the cradle, the latch in one position precluding rotation of the cradle, the latch in its other position being disengaged,



b. means carried by said latch responsive to the absence of an article in the cradle to prevent rotation of the cradle.

3,869,065

OPENER AND HOLDER FOR BAGS

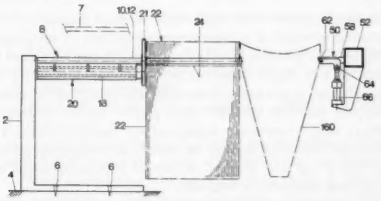
Herman Wang, Oscarsgate 74, Oslo, Norway

Filed Nov. 17, 1972, Ser. No. 307,636

Claims priority, application Norway, Nov. 17, 1971, 4238/71; Nov. 2, 1972, 3976/72

Int. Cl. B65b *43/28*

U.S. Cl. 221—40 **8 Claims**



1. Apparatus for dispensing and holding carrying bags comprising an apparatus frame; a bag magazine for a supply of individual bags, said magazine including carrying rail means for extending through the handle openings in the bags; a carrier means; a bag pick-up and holding means supported reciprocably on said carrier means in the vicinity straight forwardly from said magazine rail means, said pick-up means operative to move substantially horizontally from an initial position to the foremost bag stored in said magazine and engage particular serrations or cut-outs in the outermost bag panel only, said pick-up and holding means comprising two laterally spaced hook members adapted to engage said cut-outs in said outermost bag panel only, said hook members arranged to strike upwardly when in engagement with said panel in order to release said panel from said magazine rail means; and means for returning said carrier means including said pick-up means to said initial position; said apparatus operative to dispense and hold one bag after the other in open position suspended between said magazine rail means and said pick-up means.

3,869,066

RAZOR BLADE DISPENSER

Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plaines, N.J.

Continuation-in-part of Ser. No. 330,368, Feb. 7, 1973, abandoned. This application Dec. 10, 1973, Ser. No. 423,634

Int. Cl. B65h *1/12*

U.S. Cl. 221—102 **8 Claims**

1. In a safety razor blade dispenser of the type in which the uppermost blade in a stack of blades is adapted to be pushed end-wise into shaving position in a head of an associated razor, the combination comprising:

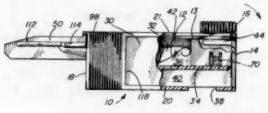
a horizontally elongated body of molded plastic having top and bottom walls, a pair of side walls extending between

said top and bottom walls, and a forward end wall extending between said side walls at one end of said body, the other end of said body being opened between said side walls,

said stack of blades being located within and extending longitudinally of said body,

said forward end wall having a blade exit aperture formed therein, and said top wall having a longitudinal slot formed therein,

a blade pusher of molded plastic slidable in said slot and including a blade-engaging portion having a forward surface below said top wall for engaging the uppermost blade in said stack of blades when said pusher is moved from a rearmost position in said slot forwardly to push the uppermost blade through said blade exit aperture, said pusher further including a finger-engageable portion above said top wall, said finger-engageable portion including a narrow transverse undersurface support portion located forward of a transverse center line of said finger-engageable portion for sliding engagement with said top wall and beveled undersurface portions extending forwardly and rearwardly from said transverse undersurface support portion, whereby said pusher pivots rearwardly about said transverse undersurface support portion to bias said forward surface of said blade-engaging portion upwardly as said pusher is moved forwardly from said rearmost position in said slot,



an end closure member positioned in said opened end of said body, and extending beneath said rearmost position in said slot, and

means in said body for biasing said stack of blades upwardly to position the uppermost blade in a horizontal plane defined by said blade exit aperture when said pusher is in said rearmost position in said slot.

3,869,067

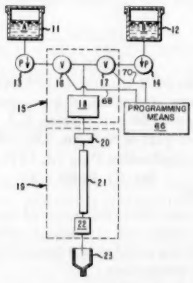
APPARATUS FOR GRADIENT ELUTION

Howard L. Ashmead; Sydnor H. Byrne, Jr., both of Newark, and John P. Wolf, III, Wilmington, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 265,994, June 26, 1972, abandoned, which is a division of Ser. No. 36,633, May 12, 1970, Pat. No. 3,712,513. This application Jan. 14, 1974, Ser. No. 433,376

Int. Cl. G05d *11/02*

U.S. Cl. 222—70 **14 Claims**



1. An elution system comprising:

a. a source of first liquid;

b. a source of second liquid;

c. first liquid supply means connected to said source of first liquid;

d. second liquid supply means connected to said source of second liquid;

e. proportioning means comprising a mixing region, valving means connected to said mixing region, and programming means connected to said valving means for continuously changing the concentration of the first and second liquids in the mixing region, said valving means having at least two operative portions, a first operative portion connected between said first liquid supply means and said mixing region in a manner such as to supply said mixing region with said first liquid when said first operative portion is activated and a second operative portion connected between at least a portion of said second liquid supply means and said mixing region in a manner such as to supply said mixing region with said second liquid when said second operative portion is activated, said programming means being adapted to separately and periodically control the time during which each operative portion of said valving means is activated and thereby change the concentration of the liquids in the mixing region, said mixing region having a volume greater than the maximum volume of liquid entering said mixing region during the period when either operative portion of said valving means is activated, and comprising means to allow a portion of any liquid contained in said mixing region to be removed from said mixing region while the liquids are being added to the mixing region.

3,869,068

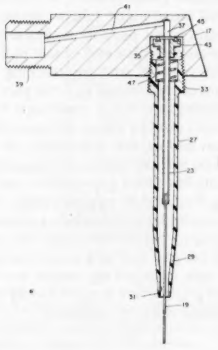
DILUTER PROBE ASSEMBLY

Bu Shing Chen, Coral Gables, Fla., assignor to Hyperion Incorporated, Miami, Fla.

Filed June 6, 1974, Ser. No. 477,152

Int. Cl. G01n *1/10*

U.S. Cl. 222—148 **8 Claims**



1. A probe assembly for use with a diluter of the type which, through a common conduit, aspirates to draw a relatively small sample and then discharges a relatively large quantity of diluent, said probe assembly comprising:

an outlet member having therein a port which is connected to the common diluter conduit;

an outer probe conduit connected to said outlet member peripherally of said port;

an inner probe conduit member including a needle-like portion extending through and below the lower end of said outer conduit, the upper end of said inner conduit

member being of substantially larger diameter than said needle-like portion and being provided with means for forming a seal to said outlet member around said port; and

means for resiliently biasing said inner conduit member upwardly into sealing engagement with said outlet member,

whereby, when the pressure at said port during discharge of diluent overcomes said resilient means, diluent can flow through said outer conduit around said inner conduit at flow rates exceeding those possible through said needle-like portion of said inner conduit.

3,869,069

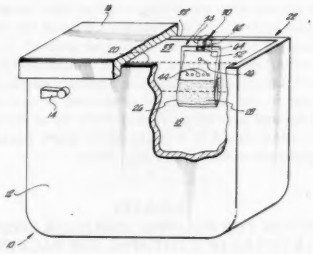
SUSPENDED DISSOLUBLE DISINFECTANT CONTAINER

John S. Levey; Sandra R. Miller, and Robert F. Levy, all of Los Angeles, Calif., assignors to Days-Ease Home Products Corp., North Hollywood, Calif.

Continuation of Ser. No. 48,896, June 15, 1970, abandoned, which is a continuation of Ser. No. 745,750, July 18, 1968, abandoned, which is a continuation-in-part of Ser. No. 692,840, Dec. 22, 1967, abandoned. This application Oct. 11, 1972, Ser. No. 296,672

Int. Cl. B67d *3/00*

U.S. Cl. 222—180 **3 Claims**



1. In a system for dispensing chemicals in the water tank of a water closet, said water tank being filled and drained periodically to and from a full level;

a closed container constructed of water impervious material with thin flexible thermoplastic side walls and having a pair of apertures spaced one below the other aperture through one of said side walls;

means for suspending said container in said tank with said aperture at a level which is at least partially below said full level;

a quantity of said chemicals partially filling said container;

a thin, flexible water soluble strip adhesively secured to and flexibly conforming with said one side wall and closing the upper of said aperture, and water soluble means covering the lower of said apertures, both said water soluble strip and water soluble means sealing interior portions of the container until said strip is submerged in the water in said tank, said water dissolving said strip to open said aperture and admit said water into said container to dissolve a portion of said chemicals and cause said dissolved chemicals to flow into said water in said tank and be dispensed by said tank when said tank is periodically drained.

3,869,070

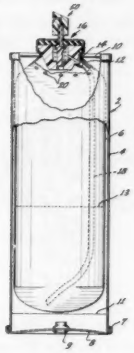
AEROSOL DISPENSING CONTAINER FOR SEPARATELY STORED FLUIDS

John C. Schmoegner, Sylmar, and Norman P. Burger, Culver City, both of Calif., assignors to MDT Chemical Corp., Gardena, Calif., by said John C. Schmoegner, a part interest

Filed Apr. 10, 1973, Ser. No. 349,827

Int. Cl. B65d *83/14*

U.S. Cl. 222—193 **10 Claims**



1. An aerosol dispensing container for separately packaging a liquid product and a liquid propellant comprising:

an outer container body;

an inner container body positioned within said outer container body;

said inner container body having an exterior opening;

said inner container body and said outer container body being sealed together adjacent said exterior opening;

an aperture in said inner container body providing flow communication for the passage of propellant vapor between said inner and outer container bodies;

said aperture being positioned adjacent the seal between said inner and outer container bodies;

said inner container body being closed to flow communication with said outer container body except through said aperture;

valve means sealingly positioned in said exterior opening;

said valve means having an open and a closed position;

said valve means providing an internal passage which communicates with an upper region of said inner container body;

a dip tube leading from said valve means to convey liquid product to said valve means;

said dip tube being closed to flow communication with the liquid propellant such that the liquid product is maintained separate from the liquid propellant as the liquid product is conveyed to said valve means through said dip tube;

said dip tube having an upper end opening in communication with said internal passage;

said upper end opening positioned with respect to said internal passage such that propellant vapor flows past said upper end opening with said valve means in its open position,

whereby, with said valve means in its closed position and said container charged with liquid product and liquid propellant, propellant vapor passes through said aperture to impose a propellant vapor pressure above the liquid product while the liquid product is separated from the liquid propellant and, with said valve means in its open position, propellant vapor flows into said internal passage from said upper region of the inner container body while liquid product is drawn up through said dip tube by flow of propellant vapor past said upper end opening with the

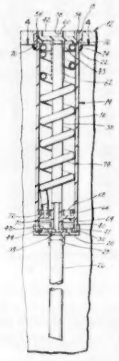
liquid product and propellant vapor being mixed in said valve means and then being discharged through said open valve means.

3,869,071

CONTAINER WITH INTEGRAL PUMP

Hess M. Roberts, 12 Crabapple Ct., St. Louis, Mo.

Filed Sept. 13, 1973, Ser. No. 396,780
Int. Cl. B67d *5/42*
U.S. Cl. 222—385 **9 Claims**



1. A device for holding and dispensing fluid comprising a container and means for delivering fluid from said container, said delivery means comprising a pump housing fastened at one end to said container and an actuator member comprising a handle seated in said pump housing when said delivery means is in a first inoperative position, said delivery means having a second operative position wherein said handle is movable with respect to said pump housing for dispensing fluid from said container, said pump housing defining a pump chamber, and said pump actuator member including a pump rod displaceable in said pump chamber, said pump rod having opposite ends, with a piston fixed to one of the rod ends and said handle affixed to the other rod end, said pump further including first and second cover means for defining opposite ends of said pump chamber, both said cover means being disposed at one end portion of said pump chamber when said delivery means is in said first inoperative position, said first and second cover means being respectively disposed at opposite ends of said pump chamber when said delivery means is in said operative position.

3,869,072

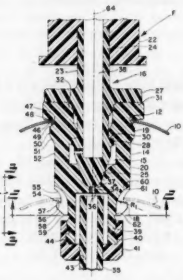
COMBINATION CHARGING AND DISPENSING VALVE FOR AEROSOL CONTAINERS

Homer F. Eyerdam, Roxboro, and Richard C. Leimbach, Durham, Both of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 10, 1972, Ser. No. 305,384
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.16 **7 Claims**

1. A two-stage valve for charging and sealing a container through an opening therein, said valve having a resilient body of generally circular cross-sectional configuration and including longitudinally-extending contiguous first shoulder, second shoulder and intermediate portions, said intermediate portion being generally cylindrical and disposed between said first and second portions, said first portion having a first annular groove and at least one discontinuous recess extending longitudinally above and below and radially inwardly of said first annular groove for charging said container when the edge of said opening is received in said first annular groove, said second portion having a second annular groove for sealing engagement with the container when the edge of said opening is received in said second annular groove after said first and intermediate portions have entered said container, the improvement comprising:

a. said recess defined as having contiguous first and second areas;



b. said first area extending radially inwardly and longitudinally downwardly from said first annular groove to the bottom of said first portion, and having a predetermined laterally-extending width; and

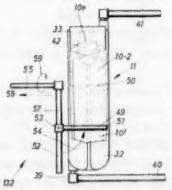
c. said second area extending longitudinally from said first annular groove to a predetermined point on the exterior surface of said resilient body and defined by first and second arcuate surfaces, said first arcuate surface defined by at least one radius struck in a horizontal plane perpendicular to the longitudinal centerline of said valve and said second arcuate surface defined by at least one second radius struck in a longitudinal plane parallel to the longitudinal centerline of said valve.

3,869,073

PROCESS FOR FOLDING SHIRTS OR SIMILAR ARTICLES OF CLOTHING FOR PACKING

Heinrich Knappe, Eidinghausen; Karl-Heinz Nolte, Vlotho, and Reinhold Kempelmann, Bad Salzuflen, all of Germany, assignors to Herbert Kannegiesser Kommanditgesellschaft, Vlotho, Germany

Filed Feb. 25, 1974, Ser. No. 445,750
Claims priority, application Germany, Feb. 26, 1973, 2309592; Nov. 22, 1973, 2358175
Int. Cl. A41h *33/00*
U.S. Cl. 223—37 **5 Claims**

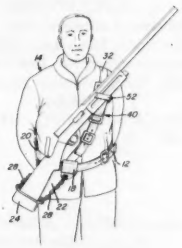


1. A process for transversely folding an article of clothing having a collar piece, for example a shirt, after the article of clothing has been longitudinally folded about a pasteboard

insert and placed on a table plate movable between a plurality of operating stations comprising the steps of:

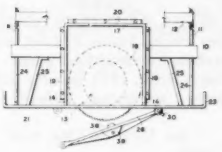
a. moving a first clamping device into operative position adjacent to said table plate;
b. clamping said article of clothing to said table plate with a first transverse clamping element at a distance from the collar piece approximately twice as great as the final transversely folded size of the article;
c. folding the portion of the article extending beyond the first transverse clamping element in the direction away from the collar piece over said first clamping element to form a first transverse fold;
d. moving a second transverse clamping element into position adjacent to said first clamping element so as to clamp the article of clothing therebetween;
e. moving said first and second transverse elements in a semi-circular path so as to form a second transverse fold in said article of clothing;
f. clamping said article of clothing at the first transverse fold with a second clamping device;
g. removing said first and second clamping elements from said article of clothing; and
h. unclamping said second clamping device.

3,869,074
SHOTGUN-RIFLE HOLDER
Raymond F. Roach, P.O. Box 333, North Bend, Oreg. 97459
Filed May 17, 1973, Ser. No. 361,274
Int. Cl. F41c *33/00*
U.S. Cl. 224—1 R **4 Claims**



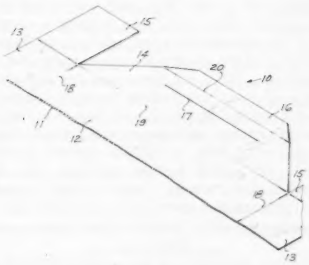
1. A weapon holder for rifles or the like comprising a belt positionable about the waist of a wearer, a shoulder strap positionable diagonally across the upper body of a wearer between the waist area on one side of the body and over the opposite shoulder, said shoulder strap having front and rear ends engageable with said belt at front and rear spaced points on one side of the body of the wearer, a butt pocket suspended from the belt generally below the belt engaged ends of the shoulder strap and freely telescopically receiving the butt of the weapon, and clip retaining means mounted on the shoulder strap in upwardly spaced relation to the front end thereof and supporting the weapon in diagonal position across the front of the wearer in accessible position for immediate withdrawal and use, said clip retaining means having an entrance opening facing inwardly of the wearer to enable swinging movement of the barrel portion of the weapon when engaging the clip retaining means, said butt pocket being suspended from the belt by front and rear means engageable with the belt immediately adjacent the points of engagement of the strap ends with the belt whereby the load of a weapon received within the butt pocket and clip retaining means provides a counterbalancing effect on the belt, a front loop and a rear loop mounted on the belt, the front end of the strap and the front means suspending said butt pocket being affixed to the front loop, and the rear end of the strap and the rear means suspending said butt pocket being affixed to the rear loop, said clip retaining means comprising a shaped block adjustably mounted on said strap, said block having a forward face, and a spring clip on said block in spaced overlying relation to said forward face for the retention of a weapon forestock or barrel therebetween, the forward face of said block being inclined downwardly and inwardly toward the shoulder strap.

3,869,075
SPARE TIRE CARRIER, REAR BUMPER AND TRAILER HITCH ASSEMBLY FOR TRUCKS
Herbert G. Kissner, Box 1391, Assinibola, Saskatchewan, Canada
Filed June 25, 1973, Ser. No. 373,610
Int. Cl. B62d *43/04*
U.S. Cl. 224—42.06 **4 Claims**



1. A device for attachment to the rear of a truck underneath the frame thereof comprising in combination an enclosed boxing adapted to receive a spare wheel and tire assembly, means to support said boxing to the underside of said truck, an access door in the front of said boxing, and means in said boxing to partially eject the associated wheel and tire assembly when said access door is opened, said means including a curved band extending around the rear perimeter of the associated tire, and tension spring means extending between the ends of said band and an anchor point adjacent each side of the open side of said boxing, normally biassing said band towards said open side.

3,869,076
GARMENT BOX
Russell Chally, 1019 Sprace St., Morris, Ill. 60450
Filed Aug. 1, 1973, Ser. No. 384,407
Int. Cl. B65d *5/26*
U.S. Cl. 229—32 **3 Claims**



1. An integral fold-up box for garments or the like comprising a square or rectangular bottom wall; a pair of upstanding, opposed, side walls joined to said bottom by way of fold-up creases, each of said side walls extending the full length of the bottom and carrying a tab at each end joined to the side wall by way of a fold-in crease, each tab being disposed at a right angle to the side wall and extending in the direction of the opposing side wall, each tab and its associated side wall thereby forming a corner for the box; a pair of upstanding, opposed, end walls joined to said bottom by way of fold-up creases, each of said end walls having a trapezoidal shape with long and short parallel sides, the long parallel side of the

trapezoid extending the full width of the bottom and being joined thereto; a pair of tuck-in flaps joined to said short parallel sides of each of said end walls by way of fold down creases, each of said flaps also having a trapezoidal shape with long and short parallel sides, the long parallel side of each flap coinciding with and being joined to the short parallel side of each end wall; and each of said end walls carrying a tuck-in slot disposed parallel to said parallel sides of the end wall, said slot being slightly longer than said short parallel side of the tuck-in flap whereby disposition of the marginal edge of the short parallel side of the flap within the slot locks the opposing corner tabs at each end of the box between the end wall and its associated tuck-in flap.

3,869,077

CARTON BLANK WITH TURN DOWN CLOSURES

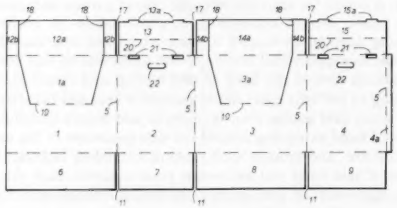
Martti Johannes Tuura, Janha, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Nov. 30, 1972, Ser. No. 310,850

Claims priority, application Finland, Nov. 30, 1971, 3424/71

Int. Cl. B65d *5/64, 5/16*

U.S. Cl. 229—16 D **5 Claims**



1. A carton blank which comprises a panel of sheet material divided into four sections connected to one another along respective fold lines that define the upright edges of the assembled carton, each section defining a corresponding upright side of the assembled carton; a plurality of first flaps each connected to a corresponding section along a fold line defining a respective bottom edge of the assembled carton, said first flaps together forming the bottom of the assembled carton; a plurality of second flaps each connected to a corresponding section along a fold line defining a corresponding top edge of the assembled carton, said second flaps together forming the top of the assembled carton; means defining in at least one of said sections and the second flap adjoining thereto a pair of spaced-apart cuts dividing the second flaps into three portions and continuing into the section to define therein a central portion connected to the central portion of the second flap and extending from a fold line located in the section intermediate the carton bottom and top edge fold lines thereof, said central portions of such second flap and section forming in the assembled carton a closure which can be turned down to render the entire interior of the carton accessible.

3,869,078

LIQUID PROOF FLAT END CONTAINER WITH RECLOSABLE POUR SPOUT

Eric A. Braun, Northville, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Dec. 18, 1973, Ser. No. 425,915

Int. Cl. B65d *5/72*

U.S. Cl. 229—17 R **9 Claims**

1. In a paperboard container, the combination, comprising:

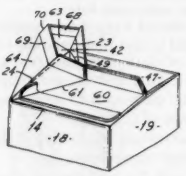
a. a tubular body having a flat end closure thereon;

b. said end closure overlying said body, and including first and second triangular panel members folded flat over the end of said body, and a pair of rectangular shaped panels defined as inner and outer roof panels which are folded over said triangular panel members;

c. each of said triangular panel members are flanked by a pair of fold back panels which join them to said inner and outer roof panels;

d. first and second pouring panels as part of said fold back panels flanking said first triangular panel;

e. first and second closure panels as part of said fold back panels flanking said second triangular panel;



f. a central sealing rib including said inner and outer roof panels, said first and second pouring panels and said first and second closure panels;

g. an outer sealing rib sealing the edge area of said outer roof panel to said inner roof panel; and

h. an opening means positioned between said central sealing rib and said outer sealing rib.

3,869,079

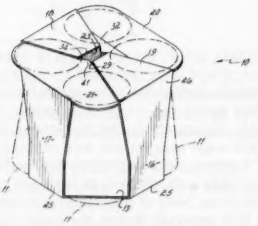
CARTON LOCK

Richard K. Oglesbee, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Continuation-in-part of Ser. No. 169,355, Aug. 5, 1971, Pat. No. 3,746,245. This application June 8, 1973, Ser. No. 368,054

Int. Cl. B65d *65/06, 75/14, 5/48*

U.S. Cl. 229—40 **4 Claims**



1. a carton blank adapted to be erected to form a package for glassware or the like,

said carton made of foldable sheet material and including a unitary top, four sides extending integrally from said top and comprising two opposed pairs oriented at right angles to the other pair, each side joined hingedly along a line to the top and being separated and spaced from the other sides along its side edges,

two foldable bottom panels associated with a first pair of said sides, each bottom panel being hingedly attached to a respective side along a line parallel to the line at which the respective side is attached to the top and being provided with a fully enclosed aperture proximate the outer margin of the panel,

the two bottom panels being overlappable to form a carton bottom, the apertures together then defining a common aperture in the carton bottom when said bottom panels are overlapped,

and two foldable locking panels associated with a second pair of said sides, each locking panel being hingedly

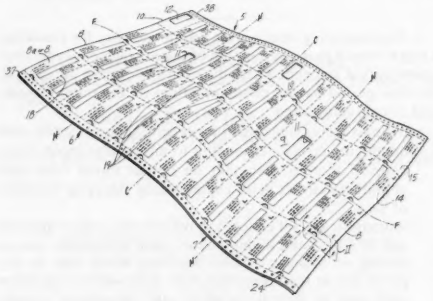
attached to the respective side along a line parallel to the line at which the respective side is attached to the top, each locking panel including an integral tab end provided with locking means formed integrally from said sheet material, said second pair of sides being bendable with respect to said top so that they project from the plane of the latter, the locking panels being foldable to overlap the bottom panels, and said tab end and the locking means being jointly insertable into said common aperture to lock in position the locking tabs and their associated panels, and to lock the two bottom panels together, thereby to form an erected carton.

3,869,080

MAILABLE MULTIPLE-ENVELOPE PACKETS

Bret W. Anderson, Northfield, and Joseph A. Steffen, Solon, both of Ohio, assignors to Bret W. Anderson & Associates, Inc., Northfield, Ohio

Filed Feb. 5, 1973, Ser. No. 329,595
Int. Cl. B65d *27/10*
U.S. Cl. 229—69 **9 Claims**



1. A packet of potential envelopes formed of plies of paper and adhesive medium comprising:

a lower ply and an upper face ply of the same width overlaying the lower ply in longitudinal and transverse coextensive relation therewith;

said packet being perforated through both plies along longitudinal tear lines and transverse tear lines to form a rectangular grid pattern of longitudinal rows and cross rows of potential envelopes and window panels, each comprising an upper face element in the upper ply in back-to-back relation with a lower element in the lower ply;

said plies being joined by said medium between opposed marginal edges along three sides of superimposed elements adjacent said lines to form each of certain pairs of superimposed elements into a potential envelope of which the elements thereof are unadhered and separable along one end when said envelope is detached from the packet;

in each of said potential envelopes said face element having a first area for receiving mailor address indicia and a second area for receiving mailee address indicia, both of said areas being transversely offset with respect to any of said medium, the location of said areas on the face elements of said potential envelopes being identical;

said packet being foldable into two superimposed layers of potential envelopes along a middle or intermediate longitudinal line of said tear lines to place the face elements of one layer against those of the other;

one of said packet layers having two of said window panels, each comprising a pair of said back-to-back elements defining a window therethrough with the window of one panel adapted to be located in registry with said first address area of a face element of the other packet layer, and the window of the other panel adapted to be in registry with said second area of another face element of said other layer; and

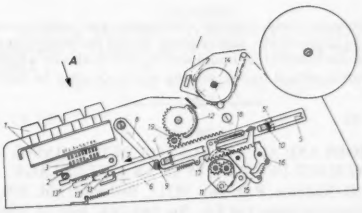
each of said potential envelopes being notched to one side of the mid point along said open end, and in identical spaced relation with respect to said address areas of said envelope.

3,869,081

VALUE INPUT MECHANISM FOR CALCULATING MACHINES

Otto Haberkorn, Gerstetten, Germany, assignor to Walther Buromaschinen GmbH, Gerstetten, Germany

Filed Oct. 11, 1972, Ser. No. 296,553
Claims priority, application Germany, Oct. 20, 1971, 2152159
Int. Cl. G06c *29/00*
U.S. Cl. 235—60 TK **4 Claims**



1. In a ten-key calculating maching, a value input mechanism responsive to the values introduced by actuating keys of a keyboard, comprising a single set pin carriage transversely moveable stepwise in response to actuation of the keys, a plurality of set pins on said carriage corresponding to the values of **1** to **9** and positioned in individual tens series, and a plurality of moveably mounted value selector members each comprising a movable toothed rack arranged in substantially a straight line and each selector member corresponding to an individual tens series of set pins, said value selector members being released by a collector shaft mounted on a pivotally mounted lever, totalizer and printer means operatively actuated by said value selector members to receive values therefrom, each value selector member having a portion thereon engageable with an actuated set pin in a corresponding tens series for actuated values of from **1** to **9**, means connected to each value selector member for moving said members in an actuated direction, the set pins of each tens series being arranged in descending order from **9** to **1** in the actuated direction of said value selector members whereby, for all calculating operations each value selector member moves in the actuated direction through a number of value divisions corresponding to the complement of **9** as an indication of the value of the actuated key.

3,869,082

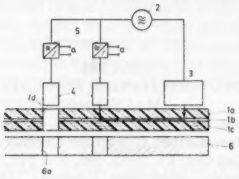
DATA STORAGE AND RETRIEVAL SYSTEM

Ludwig Ludin, Anglikon, Switzerland, assignor to Camille Bauer Messinstrumente AG, Wohlen, Switzerland

Filed Jan. 29, 1973, Ser. No. 327,504
Claims priority, application Sweden, Feb. 2, 1972, 1548/72
Int. Cl. G06k *7/08, 19/06*
U.S. Cl. 235—61.11 H **10 Claims**

1. A data storage and retrieval system comprising in combination a reading device and a document card, said reading device comprising a plurality of sensing electrodes, a counter electrode and a source of alternating potential connected therebetween, said sensing electrodes being offset from said counterelectrode, said card comprising at least one conductive layer having an area in which at least one hole is adapted to be punched, said card being positionable in said reading

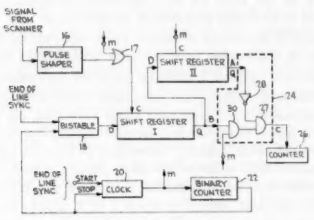
device so that said area in which said holes are adapted to be punched corresponds to the position of said sensing electrodes, said conductive layer functioning as a capacitive coupling between said sensing electrodes and said counter-electrode respectively, said reading device including discriminator means connected to said sensing electrodes by which the capacitance sensed by the sensing electrode may be derived.



3,869,083
METHODS AND APPARATUS FOR DETERMINING THE NUMBER OF OBJECTS IN AN ASSEMBLAGE

Arthur G. Malmon, P.O. Box 30211, Bethesda, Md. 20034

Continuation-in-part of Ser. No. 844,264, July 24, 1969, abandoned. This application July 24, 1972, Ser. No. 274,253
Int. Cl. G06m 11/02
U.S. Cl. 235—92 PC **27 Claims**



1. Apparatus for determining the number of objects in an assemblage comprising

means for scanning the assemblage line-by-line;

detector means for generating pulses corresponding to the number of objects encountered during each scan line;

accumulating means for storing said pulses generated during each scan line;

comparison means connected with said accumulating means and supplying difference signals corresponding to the difference in number of objects encountered during adjacent scan lines; and

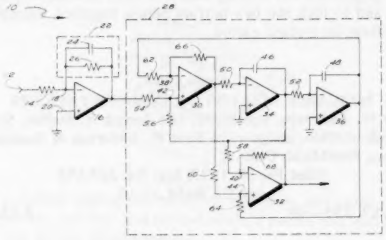
translating means receiving and totalling said difference signals and providing an output representative of the total number of objects in the assemblage,

said translating means including tally counter means receiving said difference signals from said comparison means and edge overlap compensating means for compensating for overlapping edges of objects in the assemblage during a scan line, said edge overlap compensating means receiving said difference signals from said comparison means and supplying compensating signals to said tally counter means in response to the value of said difference signals.

3,869,084
METHOD FOR DESIGNING AN INTEGRATING CIRCUIT WITH A FINITE MEMORY AND THE RESULTANT APPARATUS

Millard Dumas Longman, Jr., Miami Beach, Calif., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Aug. 20, 1973, Ser. No. 389,422
Int. Cl. G06g 7/18
U.S. Cl. 235—183 **8 Claims**



1. An integrating circuit with a finite memory for providing a signal output that is a function of the average of events over a time period just ended with the events occurring previous to the time period having minimum effect on the output signal, said circuit comprising:

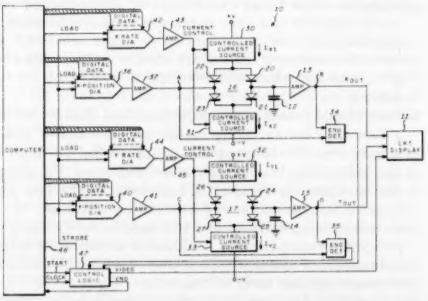
a low-pass amplifying circuit for receiving input signals, said amplifying circuit responding to an impulse input signal coupled thereto such that an output signal from said amplifying circuit is an exponentially decaying function of time;

a biquadratic circuit coupled to receive the output signal of said low-pass amplifying circuit, said biquadratic circuit having an impulse transfer function which can be expressed as at least a second order polynomial expression such that an output signal of said biquadratic circuit, when said output signal from said low-pass amplifying circuit is coupled thereto, remains approximately constant for a period of time after which the output signal of said biquadratic circuit decays rapidly to a second lower constant level.

3,869,085
CONTROLLED CURRENT VECTOR GENERATOR FOR CATHODE RAY TUBE DISPLAYS

Paul F. Green, Glendale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 17, 1973, Ser. No. 425,578
Int. Cl. G06f 3/14
U.S. Cl. 235—198 **10 Claims**



1. A vector generator for a cathode ray tube display having X and Y deflection means, comprising

X and Y capacitor means including means for coupling said X and Y capacator means to said X and Y deflection

means for storing first X and Y analog voltages, respectively, for determining the current beam position of said cathode ray tube,

X and Y position means for providing second X and Y analog voltages, respectively, representative of a new beam position to which a vector is to be drawn from said current beam position,

X and Y rate means for providing X and Y analog rate signals, respectively, representative of the X and Y drawing rates of said vector to provide a uniform drawing rate, controlled current source means coupled to said X and Y rate means, respectively, for providing respective currents controlled in accordance with said X and Y rate signals, and

current control means coupled to said capacitor means, position means and controlled current source means for directing said controlled currents into said respective capacitor means from said controlled current source means until said first voltages are rendered equal to said second voltages respectively,

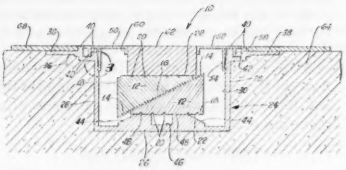
whereby a vector is drawn from said current beam position to said new beam position at a uniform drawing rate for all vectors.

3,869,086

ADJUSTABLE TRACK ASSEMBLY

Donald T. Heaney, 32316 Phantom Dr., Palos Verdes, Calif. 90501

Filed Dec. 22, 1971, Ser. No. 210,954
Int. Cl. E01b *2/00, 23/00*
U.S. Cl. 238—10 R **12 Claims**



1. A track assembly for supporting a track bearing a carriage for files and cabinets, comprising:

a housing with a base having an abutment formed in its center portion with a longitudinal rib on its top surface and with two opposite side walls each having a longitudinal groove and an inward taper at the top portion of their inner surfaces and having a longitudinal groove formed at the top portion of each of their outer walls; and

a pair of wedge members each having a series of rows of teeth formed on the surfaces of their longest sides, said teeth interlocking with each other when said longest sides of said wedge members are superimposed, each of said wedge members having a groove formed in one of their remaining sides to receive said longitudinal rib of said abutment of said housing;

whereby said track assembly can be adjusted to maintain said track in a level position.

3,869,087

WATER SPRAY COOLING SYSTEM

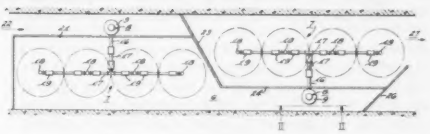
R. Barry Erickson, Cincinnati, Ohio, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 13, 1973, Ser. No. 397,130
Int. Cl. B05b *17/08*
U.S. Cl. 239—128 **6 Claims**

1. A system for cooling water in a continually flowing stream having a layer of relatively hotter water at the surface of said stream, said system comprising:

a plurality of pumps having their intakes located in said stream in spaced relation to one another;

a plurality of water spray heads connected to the discharge of said pumps to receive the hotter water therefrom and spray said water into the atmosphere above the stream to cool same; and



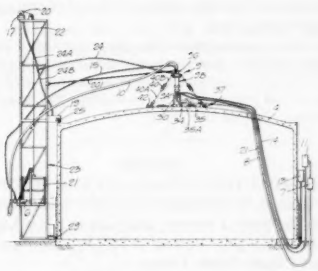
baffle means positioned in said stream defining a pump area and a spray head area, said baffle means prohibiting the flow of said hotter surface water from bypassing said pump intakes.

3,869,088

SWIVEL ASSEMBLY FOR GUNITE SYSTEMS

Maximiliaan J. Dykmans, 4434 Mayanan Dr., La Mesa, Calif. 92041

Filed Apr. 24, 1972, Ser. No. 247,139
Int. Cl. B05b *15/00*
U.S. Cl. 239—177 **10 Claims**



1. In a system for spraying a structure having a surface around a common point or line; a nozzle; swiveled conduit means; a plurality of sources of conveyable components; conduit means extending from said sources to said swiveled conduit means and conduit means extending from said swiveled conduit means to said nozzle; said swiveled conduit means incorporating wall means defining at least two separate passageways; and means for transferring said components from their corresponding source through a corresponding passage and to said nozzle; said swiveled conduit means including swivel bearing means and seal means between said wall means; liner means defining a conduit and protecting said bearing means and said seal means and spaced therefrom to define a space; and means flowing a material through said space to prevent material flowing through said conduit from entering said space between said liner and said bearing means; and said seal means.

3,869,089

TRIGGER ASSEMBLY FOR MANUALLY OPERABLE SPRAY APPARATUS

Alvydas Petras Karasa, Baltimore, Md., and Jonathan Durand Bell, Kooskia, Idaho, assignors to The Black and Decker Manufacturing Company, Towson, Md.

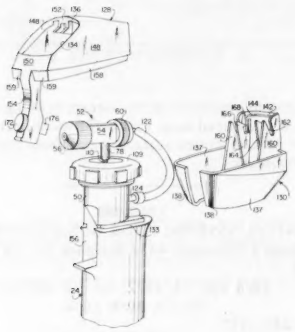
Filed Jan. 3, 1974, Ser. No. 430,535
Int. Cl. B65d *83/14*
U.S. Cl. 239—338 **20 Claims**

1. A trigger assembly for a spray gun including a handle which supports a valve provided with a displaceable actuator

and a spray head mounted on the actuator in fluid communication with the valve, comprising:

a cup-shaped trigger saddle mounted on the handle and provided with an open top end surrounding the valve;

a manually operable, hood-shaped trigger member for engaging and moving the spray head to displace the actuator, said trigger member including an open bottom end



shaped to mate with said open top end of said cup-shaped trigger saddle; and

means for pivotally mounting said trigger member on said trigger saddle to permit movement of said trigger member into engagement with the spray head upon manual operation of said trigger member to displace the spray head and actuator to open the valve.

3,869,090

COMMINUTING APPARATUS AND METHOD

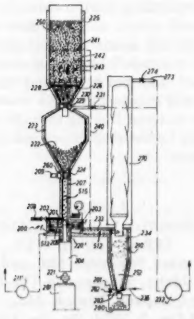
Jacques Roussel, St. Germain D Hauterives, and Georges Perrin, Vizille, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude, Paris, France

Filed July 23, 1973, Ser. No. 381,594

Claims priority, application France, July 27, 1972, 72.27028

Int. Cl. B02c *13/09*

U.S. Cl. 241—5 **19 Claims**



1. In an apparatus for grinding particles of solid material comprising:

1. a wall having substantially a shape of revolution about an axis and defining a grinding chamber,

2. at least one rotor disposed coaxially within said grinding chamber, comprising:

— a body having a shape of revolution about said axis

— centrifugal flow guide means for the particles to be ground, secured to said body, uniformly distributed angularly about said axis, each of said centrifugal flow guide means extending radially from an internal extremity for the extraction of said particles to be ground, located in an axial receiving zone for said particles, up to an external extremity for the projection of said particles, located at the outer circular periphery of said rotor, and each of said centrifugal flow guide means having a front surface with respect to the direction rotation of said rotor for displacement of said particles, said front displacement surface having a concave profile from said internal extraction extremity to said external projection extremity of said particles to be ground,

3. means for introducing said particles to be ground, in communication with said axial receiving zone of said rotor,

4. annular impact means disposed in said grinding chamber, and surrounding said rotor,

5. evacuation means for said ground particles, in communication with a peripheral grinding zone, adjacent to said annular impact means,

6. a driving shaft for said rotor passing through said wall of said grinding chamber;

the improvement wherein, in combination:

a. at said external projection extremity, the profile of said front displacement surface of each said centrifugal flow guide means forms an angle comprised between 0° and 10° with said outer circular periphery of said rotor, and b. at said internal extraction extremity, the profile of said front displacement surface of each said centrifugal flow guide means forms an angle comprised between 0° and 10° with the inner circular periphery of said axial receiving zone.

3,869,091

TUBE MILL

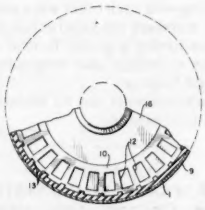
Torben Enkegaard, and Helge Carl Christian Kartman, both of Copenhagen Valby, Denmark, assignors to F. L. Smidth & Co., Cresskill, N.J.

Filed May 8, 1973, Ser. No. 358,686

Claims priority, application Great Britain, May 10, 1972, 21884/72

Int. Cl. B02c *17/02, 17/22*

U.S. Cl. 241—183 **9 Claims**



1. A grinding mill for grinding a material charge which comprises a mill body having at least one grinding chamber, a lining of wear resistant non-metallic resilient material in said grinding chamber, lifting means in said grinding chamber mounted on the resilient lining for lifting and cascading the material to be ground, and a plurality of ring shaped partitions within said chamber, said partitions being substantially equally

spaced along the axis of the mill and define at least a central opening and a plurality of openings arranged in a substantially circular pattern so as to provide additional lifting action on the material charge while permitting the material to pass therethrough without interruption in a substantially longitudinal direction.

3,869,092

ENDLESS TAPE CARTRIDGE

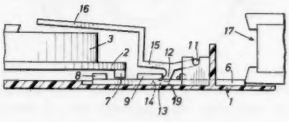
Kimio Tanaka, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 408,900

Claims priority, application Japan, Apr. 25, 1973, 48-48671[U]

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 A **8 Claims**



1. Apparatus comprising an endless tape cartridge; a reel rotatably mounted on said cartridge, said reel being adapted to carry an endless roll of tape; an arresting lever having structure for cooperation with a mating structure on said reel for arresting rotary movement of said reel, said arresting lever being slidably mounted on said cartridge for linear reciprocating motion along a path radial to said reel; a clamping lever pivotally mounted on said cartridge for clamping an endless roll of tape on said reel; and means extending between said levers for pivoting said clamping lever in a direction away from said reel in response to reciprocation of said arresting lever along said path toward said reel.

3,869,093

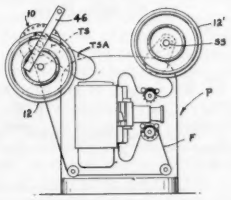
FILM HANDLING SYSTEM

Walter Thomas Ackermann, Watertown, Conn., assignor to Indevco Corporation, Watertown, Conn.

Filed Sept. 12, 1972, Ser. No. 288,254

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.21 **6 Claims**



1. For a motion picture projector, a film handling system which eliminates the need for rereeling comprising:

a. a take-up drive attachment adapted to be supported solely by and driven by the take-up drive shaft of a projector including a generally cylindrical hub having an axial opening a drive spindle journaled in the opening for rotation and having in one end an axial opening adapted to receive the take-up drive shaft of the projector in driving engagement, the opposite end of the spindle having a film-engaging sprocket with outward teeth to be received into the perforations in the film, guide means on the hub for guiding the film in spiral fashion from the said one end of the hub outward about the hub into engagement with the sprocket, support means on the hub immediately above the sprocket and means for keeping the hub from rotating when the shaft rotates;

b. a shallow cylindrical film container having a circular side wall and an end wall, the side wall having a slot for egress of the outer or leading end of the film, the end wall having a central opening adapted to fit into the film supply reel shaft; whereby the film container may be hung by the inside of its circular wall on said support means with the container end wall adjacent the sprocket, and the leading end of the film may be extended over the support means through the slot in the container and attached to the outside of the container so that as the film is driven by the spocket, it forces the rotation of the container and accumulates about the inside of the side wall of the container, winding from outside to inside, the support means engaging the last-deposited layer of film to support the container and whereby once the entire length of the film is in the container, the container may be removed from the attachment and mounted on the film supply shaft of the projector by its central opening, and the leading end may be fed into the projector for viewing without rereeling.

3,869,094

ADHESIVE TAPE DISPENSER

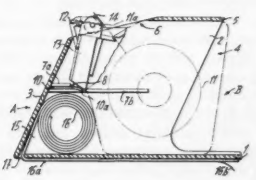
Heinz Hermann Weick, 94, rue de la Servette, Genf; Viktor Trueb, Oberhelfenschwil, and Walter Hesener, Meyrin, all of Switzerland, assignors to said Weick by said Trueb and said Hesener

Division of Ser. No. 218,930, Jan. 19, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,249

Claims priority, application Switzerland, Jan. 21, 1971, 1028/71; Apr. 29, 1971, 6372/71; Nov. 14, 1971, 16536/71

Int. Cl. B65h *19/02*

U.S. Cl. 242—55.53 **6 Claims**



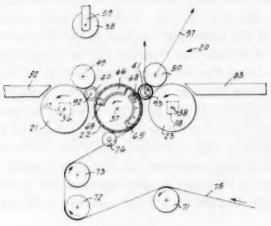
1. In combination with a manually operated adhesive tape dispenser including a casing and having a movable sliding member for applying the adhesive tape, one end of said sliding member being adapted to deflect the adhesive tape and extending through an opening in a sliding surface integrally formed with said casing and the other end of said sliding member projecting from said casing outside said sliding surface for manual operation, a base adapted to receive and support said adhesive tape dispenser, said base comprising:

1. a bottom wall for securing said base to a support;
2. a front member extending from said base;
3. two side members extending from said base;
4. means provided on said side members to engage with said dispenser and releasably to hold said dispenser in said base;
5. resilient means attached to said base in the area of said front member and adapted to urge said sliding member of said dispenser when inserted into said base towards said opening in said sliding surface; and
6. a second adhesive tape on said bottom wall of said base adapted to secure adhesively the bottom wall of said base to a support.

3,869,095
THREE DRUM WINDER

Jack L. Diltz, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 23, 1973, Ser. No. 408,537
Int. Cl. B65h 19/20, 17/08
U.S. Cl. 242—56 R 25 Claims



1. In a winder for a web of sheet material adapted for continuous operation the subcombination comprising

A. three axially revolvably mounted drums including mounting means therefor each having generally cylindrical side wall portions, the axes of said drums being generally aligned and in spaced, parallel relationship with each other, said side wall portions of said drums being in adjacent spaced relationship one to another, the two laterally outermost drums being displaced one from the other with the third drum being centrally disposed therebetween with the axis thereof not below the axes of said outermost drums, said third drum having a plurality of apertures defined in its said side wall portions,

B. means for axially revolvably mounting a pair of vacuumizable core shaft members, one such core shaft member being positioned with its circumferential side walls supported by one of said outermost drums and said third drum, the other of such core shaft members being positioned with its circumferential side walls supported by the other of said outermost drums and said third drum whereby said drums are adapted to rotatably drive said core shaft members,

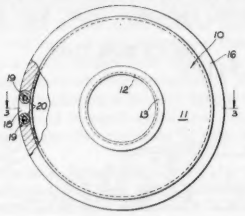
C. a pair of stationary vacuum box means circumferentially located within but adjacent said cylindrical side wall portions of said third drum, each of said vacuum box means being circumferentially spaced from the other thereof, each one of said vacuum box means terminating at a position longitudinally across the circumference of said third roll which just precedes the position longitudinally where a different one of said core shaft members, when such is positioned in said means for axially revolvably mounting such, contacts said third roll initially, each one of said vacuum box members being adapted to exert a reduced gas pressure through said third drum, and

D. a pair of stationary pressurized box means circumferentially located within but adjacent said cylindrical side wall portions of said third drum, each of said pressurized box means being circumferentially spaced from the other thereof, each one of said pressurized box means commencing at a position longitudinally across the circumference of said third roll which just precedes the position longitudinally where a different one of said core shaft members, when such is positioned in said means for axially revolvably mounting such, contacts said third roll initially, each one of said pressurized box means being adapted to exert a superatmospheric gas pressure through said third drum.

3,869,096
HOUSINGS

Brian David Hogan, Rowley Regis, and Dennis Frederick Poole, Solihull, both of England, assignors to Rabone Chesterman Limited, Birmingham, England

Filed Jan. 7, 1974, Ser. No. 431,491
Claims priority, application Great Britain, Feb. 3, 1973, 5477/73
Int. Cl. B65h 75/00
U.S. Cl. 242—84.8 5 Claims

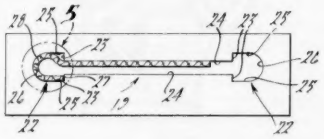


1. A housing for a reel carrying a flexible elongate element comprising a pair of substantially uniform side members provided with formations on which the reel is operatively journalled; characterised by a collar member attached between and spacing apart the side members and defining, in combination with edge portions of said side members, a mouth through which the elongate element can be withdrawn or rewound, said side members being discs and the collar member being circular so as to form a drum-shaped housing, and each side member comprising a dished element whose periphery has an axially extending flange edged by a radially outwardly projecting lip, and a side ring fitting around said flange for attachment to the collar member.

3,869,097
WEBBING SLOT FOR SEAT BELT RETRACTOR HOUSING

Richard E. Peel, Farmington Hills, and Arild O. Saethre, Troy, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,820
Int. Cl. B65h 25/48
U.S. Cl. 242—107 6 Claims



1. A seat belt retractor housing having in a wall an elongated slot through which webbing of a seat belt segment coupled to a retractor within the housing may be protracted and retracted,

the width of the slot in a direction normal to its elongation being slightly greater than the webbing thickness,

the slot at each of its ends having an enlargement terminating in a rounded end wall,

and stop means inwardly of a rounded end wall to prevent reverse entry of the webbing into the slot upon any lateral shift of the webbing into engagement with the respective end wall as the webbing is protracted and retracted.

3,869,098

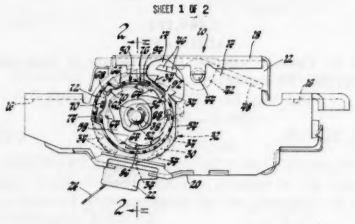
VEHICLE OCCUPANT RESTRAINT BELT RETRACTOR

Raymond G. Sprecher, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1973, Ser. No. 390,781

Int. Cl. A62b *35/02*; B65h *63/04*

U.S. Cl. 242—107.4 **2 Claims**



1. In a vehicle occupant restraint belt retractor including a housing adapted to be mounted on a vehicle, a belt reel rotatably supported by the housing, an occupant restraint belt wound and unwound from the reel upon reel rotation in opposite directions, means normally biasing the reel in the belt winding direction of rotation, and an inertia locking mechanism for selectively locking the belt reel against rotation in the belt unwinding direction, a mechanism for selectively preventing the biasing means from rotating the belt reel in the belt winding direction so as to hold the belt in an unwound condition for use, the mechanism comprising:

a circular ratchet configuration on the belt reel concentric about the axis of rotation thereof and having locking surfaces spaced circumferentially thereabout so as to face in the belt winding direction of reel rotation;

a detent member mounted on the housing for movement between a nonlocking position out of engagement with the circular ratchet configuration so as to permit belt winding reel rotation and a locking position in engagement with the ratchet configuration so as to prevent this belt winding reel rotation;

means biasing the detent member to the locking position;

the belt reel having an annular surface generated about the axis of reel rotation and rotatable therewith during belt winding and unwinding reel rotation;

a control disk rotatable with respect to the reel about the rotational axis thereof and having one side engaged with the annular surface of the reel, the control disk including a control portion that engages the detent member to move this member to the nonlocking position when the control disk rotates in the belt unwinding direction so that the reel is thereby free to rotate in the belt winding direction, a first pair of engageable surfaces on the control disk and the housing for limiting the rotation of the control disk in the belt unwinding direction after the detent member has been moved to the nonlocking position, and a second pair of engageable surfaces on the control disk and the housing for limiting the rotation of the control disk in the belt winding direction of rotation so that the total rotation of the control disk is less than one revolution;

a blocking disk rotatable with respect to the reel about the rotational axis thereof and being positioned on the opposite side of the control disk from the annular surface of the reel, the blocking disk having a blocking portion with a notch for holding the detent member in the nonlocking position after the control disk moves the detent member to this non-locking position, the detent member engaging the blocking portion to limit movement of the blocking disk in the belt winding direction, and a pair of engageable surfaces on the housing and the blocking disk for limiting rotation of the blocking disk in the belt unwinding direction so that the total rotation of the blocking disk is less than one revolution; and

a resilient spring means engaging the side of the blocking disk opposite the control disk so as to bias the blocking disk into frictional engagement with the control disk and to in turn bias the control disk into frictional engagement with the annular surface of the reel so that reel rotation rotates the control disk in a clutched manner between the limits of its rotation and rotation of the control disk rotates the blocking disk in a clutched manner between the limits of its rotation, the control disk being rotated by this clutching to its limit of rotation in the belt unwinding direction as the belt in unwound to thereby move the detent member to its nonlocking position, the notch in the blocking portion of the blocking disk engaging the detent member to hold the detent member in the nonlocking position so as to permit the reel to wind the belt and to concomitantly prevent the clutching of the blocking disk to the control disk from rotating the blocking disk in the belt winding direction with the control disk, the blocking disk being subsequently moved in the belt unwinding direction of rotation by the control disk as the belt is unwound so as to disengage the detent member and allow the bias thereof to move the detent member to locked position and to thereby prevent belt winding until the belt is subsequently unwound a sufficient extent to again engage the control portion of the control disk with the detent member so as to again move the detent member to the nonlocking position.

3,869,099

TAPE RECORDING AND/OR REPRODUCING APPARATUS AND TAPE CASSETTE FOR USE THEREWITH

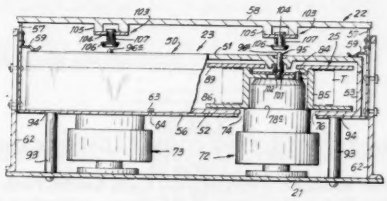
Katsu Inaga, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 12, 1973, Ser. No. 415,220

Claims priority, application Japan, Nov. 13, 1972, 47-130617

Int. Cl. G03b *1/04*; G11b *15/32*, *23/04*

U.S. Cl. 242—199 **27 Claims**



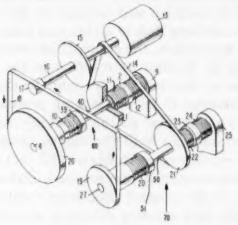
1. A tape cassette comprising a housing having two substantially parallel opposed walls, at least one reel having tape wound thereon and being contained in said housing for rotation about an axis substantially normal to said walls and for axial displacement between said walls, one of said walls having a bore therein which is substantially centered in respect to said reel, a floating member axially movable in said bore and having means at the inner end of said floating member within said housing for engagement axially with said reel, means urging said floating member and said reel axially toward the other of said walls for normally disposing said floating member in a retracted position in respect to said one wall, and an aperture in said other wall which is substantially centered in respect to said reel and through which the latter is adapted to be engaged for controlling the rotation of said reel and for axially displacing the reel toward said one wall so as to similarly displace said floating member to a projecting position in respect to said one wall and at which said floating member is engageable outside of said housing for firmly establishing a predetermined axial location of said reel.

3,869,100

RECORDING TAPE DRIVE APPARATUS

George Burdine Flippen, Jr., Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 28, 1972, Ser. No. 293,252
Int. Cl. G11b *15/28, 15/32*
U.S. Cl. 242—201 **3 Claims**



1. A recording tape drive apparatus comprising:

a. a first unit having 1) an input shaft, 2) an output shaft for tape reel means on and from which a tape can be alternately wound and unwound, and 3) a number of direction actuatable spring clutch means including a pulley clutch, a check clutch, and a drag clutch for connecting said input and output shafts of said first unit and providing, separately, slip, grip, and drag when said tape is driven in a first and a second direction, and arranged for effecting respectively and alternately, take-up and supply tensioning of said tape when driven in said first and second directions; and

b. a second unit having 1) an input shaft, 2) an output shaft for tape reel means on and from which said tape can be alternately wound and unwound, and 3) a number of direction actuatable spring clutch means including a pulley clutch, a check clutch, and a drag clutch for connecting said input and output shafts of said second unit and providing, separately, slip, grip, and drag when said tape is driven in said first and second directions, and arranged for effecting respectively and alternately, take-up and supply tensioning of said tape when driven in said first and second directions; and

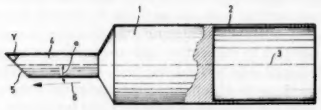
c. drive means for driving said tape and said input shafts of said first and second units in said first and second directions.

3,869,101

INFANTRY MISSILE FOR COMBAT AGAINST GROUND TARGETS

Werner Schnabele, Wolfratshausen; Georg Knoche, Furth, and Fritz Zeyher, Ottobrunn, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Postfach, Germany

Filed May 7, 1973, Ser. No. 358,079
Claims priority, application Germany, May 10, 1972, 2222785
Int. Cl. F42b *15/18, 15/10, 13/00*
U.S. Cl. 244—3.1 **13 Claims**



1. A nonrotational infantry missile, launchable from a launching device primarily for combat against ground targets, comprising:

a cylindrical body, the rear part of said body comprising means for achieving an aerodynamically stable flight position without missile rotation, such means defining a hollow cylindrical jacket;

a cylindrical forward extension coaxially fixed to said body;

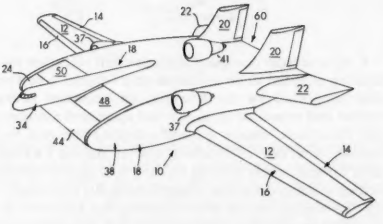
lift producing trim means fixed on the missile for straightening the flight path of the missile to make said path substantially rectilinear.

3,869,102

AIRCRAFT

Charles A. Carroll, Atlanta, Ga., assignor to International Husky, Inc., Bloomfield Hills, Mich.

Filed May 24, 1972, Ser. No. 256,394
Int. Cl. B64c *3/02*
U.S. Cl. 244—36 **6 Claims**



1. An aircraft comprising:

A. a hull having a roll axis and including a plurality of juxtaposed hull modules, each module including:

i. a planar cargo support means extending substantially throughout the length and width of the hull module,

ii. an external covering surrounding said cargo support means, said covering means constituting an airfoil in the vertical cross sections parallel to the roll axis and being substantially rectangular in cross sections normal to the roll axis to thereby provide a substantially structurally unobstructed cargo space above said support means throughout said hull module, said hull module generating a lift in flight which substantially offsets the combined weight of said hull module and the cargo it carries,

B. wings connected to said hull,

C. means for controlling the aircraft in flight connected to said hull and wings,

D. means for powering the aircraft, and

E. a fuselage connected to an upper portion of said hull to be completely above said cargo space in one of said hull modules.

3,869,103

RETRACTION SYSTEM FOR DOUBLE POD AIR CUSHION LANDING GEAR SYSTEM

Bud D. Nelson, Kent, and William M. Brennan, Edmonds, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1973, Ser. No. 406,064
Int. Cl. B60v *3/08*
U.S. Cl. 244—100 R **14 Claims**

1. A retraction system comprising:

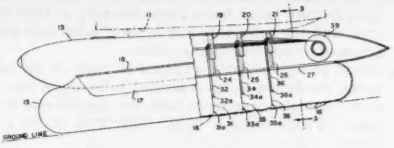
rigid container means having an opening therein;

an inflatable member sealingly attached to said container means at said opening to form an enclosure;

a plurality of cords entirely within said enclosure and operatively connected at their respective one ends to the inner surface of said member at spaced intervals; and

retraction means operatively mounted within said container

means and operatively connected to the respective other ends of said cords for reeling in said cords and thereby



retracting said member into said container means when said member is deflated.

3,869,104

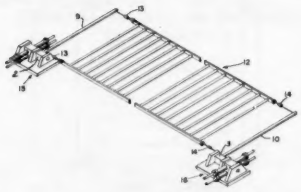
AIRCRAFT BARRICADE NET ERECTION SYSTEM

Eugene Gallo, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 28, 1973, Ser. No. 419,575

Int. Cl. B64f *1/02*

U.S. Cl. 244—110 C **5 Claims**



1. In combination with an aircraft arresting system, said system comprising a crossrunway barrier member adapted to be engaged by an aircraft upon landing and supported at each end by a pair of stanchions mounted on opposite sides of the runway for movement between raised and lowered positions, a control means for raising and lowering said stanchions comprising:

fluid powered stanchion actuator means connected to each stanchion for raising and lowering the same and including at least one rack and pinion arranged in cooperative relationship;

hydraulic power pack means operatively connected to each said stanchion actuator means for supplying high pressure fluid to and exhausting spent fluid from said stanchion actuator means; and

wherein said hydraulic power pack means includes,

a three-position, solenoid-controlled distribution valve, said distribution valve having an internal pilot line arranged to prevent operation of said distribution valve in the absence of sufficient fluid pressure;

an accumulator operatively connected to said stanchion actuator means by said distribution valve;

means connected to said accumulator for recharging said accumulator;

a flow control valve hydraulically connected between said distribution valve and said stanchion actuator means;

said flow control valve including a free flow path and a variable orifice path parallel to said free flow path;

said distribution valve arranged to channel high pressure fluid directly to said stanchion actuator means and to channel exhausted fluid through said free flow path when said barrier member is raised; and

said distribution valve arranged to channel high pressure fluid to said stanchion actuator means via said variable orifice path and to channel exhausted fluid around said flow control valve when said barrier member is lowered.

3,869,105

FURNITURE LEGS

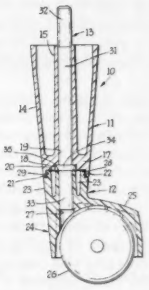
Raymond Robert James Daniels, Kings Lynn, England, assignor to Guy Raymond Engineering Company Limited, Norfolk, England

Filed Dec. 29, 1972, Ser. No. 319,498

Claims priority, application Great Britain, Jan. 7, 1972, 72/890; July 12, 1972, 72/32594

Int. Cl. B60b *33/02*

U.S. Cl. 248—188.8 **1 Claim**



1. A leg for attachment to an article of furniture comprising an upper leg portion, a lower leg portion and a tie rod extending through the upper leg portion and into the lower leg portion, an annular flange on the tie rod located between the upper and lower leg portions whereby the lower leg portion can rotate freely on the tie rod and substantially the whole of any forces applied downwardly to the tie rod or to the upper leg portion are transmitted to the lower leg portion through the flange, snap engaging annular lip and groove elements on said lower leg portion and said upper leg portion, respectively, for axially retaining said lower leg portion on said upper leg portion and enabling said lower leg portion to be rotatable relative to said upper leg portion and to be axially disengageable therefrom under normal working conditions.

3,869,106

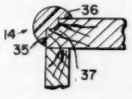
SAFETY BUMPER FOR FURNITURE

Stephen Gregov, 3745 West 60th Pl., Chicago, Ill. 60629

Filed Nov. 22, 1972, Ser. No. 308,840

Int. Cl. A47b *96/00*

U.S. Cl. 248—345.1 **1 Claim**



1. A protective safety bumper intended for covering exposed sharp edges, corners, and the like of an article of furniture, the bumper comprising, in combination:

a longitudinally elongated reusable strip of resilient maaterial adapted to straddle the exposed edge, exposed corners, and the like of the article of furniture and extend completely therealong;

said strip of resilient material being of an elongated solid cylindrical configuration having a circular cross-section; said strip of resilient material being manufactured of a flexible polyurethane plastic material;

a notch extending longitudinally through a side wall of said strip of material completely between opposite ends of said strip of material;

said notch having a generally W-shaped cross-sectional configuration consisting of two adjacent parallely extending contiguous V-shaped cross-sectional configuration disposed side-by-side with the respective surfaces of each of the V-shaped configurations being in parallel relationship to each other, thus being a total of four surfaces defining the W-shaped configuration with a first pair of two of said surfaces being parallel to each other and a second set of two surfaces being parallel to each other;

said W-shaped notch being of a cross-sectional configuration complementary to the edge, corner and the like to be protected on the article of furniture;

the apex portion of said W-shaped configuration disposed along a diametric line of said strip material;

the two bottommost points of said W-shaped notch configuration lying co-planar along a diametric line of said strip of material;

a coating of pressure-sensitive adhesive material disposed completely along each of said four surfaces of said W-shaped notch, said adhesive adapted for removably securing said strip of material to said article of furniture with said notch surfaces straddling said edge of said article of furniture to be protected and with said notch surfaces being disposed in contacting juxtaposition with said complementary surfaces of said article of furniture;

a thin flat elongated sheet of flexible plastic film-like material completely covering said coating of pressure sensitive adhesive, the film sheet adapted to be peeled from said pressure sensitive coating immediately prior to application of the strip of material to the surface of the article of furniture to be protected;

whereby said strip of resilient material defines a shock absorbing cusion disposed along the surface of said article of furniture to be protected thereby.

3,869,107

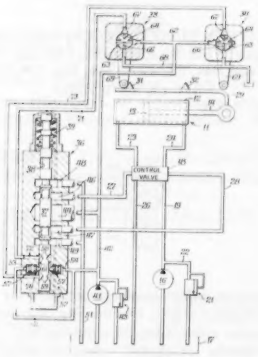
HYDRAULICALLY ACTUATED DETENT MECHANISM

Jesse L. Field, Jr., Braidwood, and Glen J. Medina, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 4, 1973, Ser. No. 394,189

Int. Cl. F16k *35/00*

U.S. Cl. 251—94 **8 Claims**



1. A hydraulic detent mechanism in a control valve having an elongated spool axially movable in a bore of a valve body for regulating fluid communication with a motor means, comprising

a portion of the spool forming axially spaced apart depressions,

the valve body forming a plurality of circumferentially spaced apart, radial bores communicating at their inner ends with the valve bore and at their outer ends with a common pressurized fluid conduit,

a detent plunger slidably arranged in each of the radial bores, the detent plungers tending to be urged into balanced detent engagement with the depressions in the spool by fluid pressure in the outer ends of the radial bores.

3,869,108

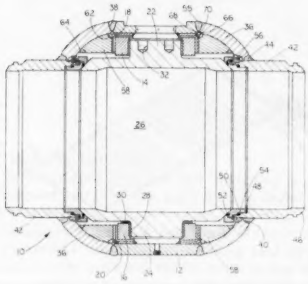
WELDED VALVE BODY CONSTRUCTION

Donald E. Graham, San Leandro, Calif., assignor to Valve Systems International, Inc., Bala Cynwyd, Pa.

Filed Jan. 7, 1974, Ser. No. 424,541

Int. Cl. F16k *27/10*

U.S. Cl. 251—366 **4 Claims**



1. A fabricated quarter turn valve comprising:

a rotary plug member having opposite coaxial trunnions thereon;

a relatively narrow cylindrical central body band section;

a pair of bearing blocks welded in said central section and rotatably receiving said trunnions;

a pair of tapered tubular end closures, each of substantially the diameter of said central sections at its inner end and reduced to a smaller diameter at its outer end;

valve sealing means including resilient seal members carried adjacent said outer end;

a pair of support blocks welded into at least one of said end closures at diametrically opposite portions thereof; and

a pair of welds joining said inner ends and said central section so that said support blocks engage corresponding sides of said bearing blocks.

3,869,109

RAILING CONSTRUCTION

Dominic Russo, Cuyahoga, Ohio, assignor to Russo Ornamental Iron Products, Inc., Bedford Heights, Ohio

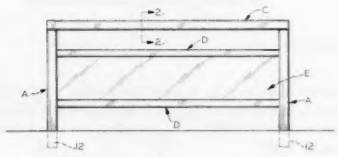
Filed July 9, 1973, Ser. No. 377,411

Int. Cl. E04h *17/14*

U.S. Cl. 256—59 **16 Claims**

1. A railing construction including vertical posts and a top railing, a one-piece frame member positioned between said posts and having a substantially inverted U-shaped configuration comprised of a substantially horizontal upper portion and

spaced vertical portions integral therewith at its ends and vertically extending channel members coacting with said vertical portions by means of integral cooperating interdigitated locking means to form the posts for said railing.

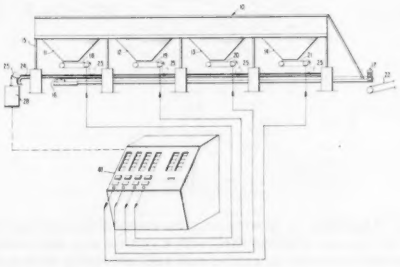


3,869,110

AGGREGATE ANALYSIS AND DELIVERY SYSTEM

James Donald Brock; Erbie G. Mize, and Henry G. Rylander, all of Chattanooga, Ga., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Nov. 24, 1972, Ser. No. 309,112
Int. Cl. B28c *7/04*
U.S. Cl. 259—149 **2 Claims**



1. A method of delivering a mixture of aggregate particles within a prescribed range of particle sizes to an asphalt preparation plant or the like, comprising:

feeding aggregate particles from a plurality of aggregate storage bins to a common conveyor means, each of said bins containing aggregate of a specified size range differing from each of the other bins;

conveying the aggregate with the conveyor means to the asphalt preparation plant;

periodically retrieving a sample batch of aggregate fed from each storage bin;

releasing each sample batch of aggregate in a liquid medium above a weighing scale;

detecting the time lapse and the accumulated weight on the weighing scale;

calculating the weight percentage of the particle sizes found in the sample batch; and

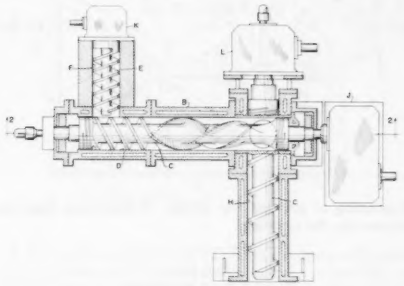
regulating the quantity of aggregate particles fed from each of the aggregate storage bins in response to the weight percentage of the particle sizes found in the sample batches.

3,869,111

APPARATUS FOR MIXING RUBBER, ELASTOMER, PLASTIC AND THE LIKE

James T. Matsuoka, Brecksville, Ohio, assignor to Intercole Automation, Inc., Cleveland, Ohio

Filed Dec. 10, 1973, Ser. No. 422,984
Int. Cl. B29f *3/02*
U.S. Cl. 259—192 **11 Claims**



1. In apparatus for processing materials including solid ingredients which become gelatinous at above ambient temperature, such as rubbers, elastomers, plastics and like mixes: structure forming a cylindrical tubular material processing chamber having a discharge opening adjacent to one end thereof; a rotor supported for rotation in said chamber and having material processing blade portions with convex leading sides, orientated more lengthwise of the axis of the rotor than circumferentially thereof and twisting in opposite directions with the ends thereof adjacent one another trailing; means for rotating said rotor; said structure also forming a material feed conduit communicating with said chamber adjacent the end thereof opposite said discharge opening and extending transversely of said chamber; a material feed screw supported for rotation in said feed conduit; means to rotate said feed screw; said structure also forming a hopper opening into said feed conduit; said structure forming said chamber and said conduit having passageways therein for the circulation of heat exchange medium in the walls thereof.

3,869,112

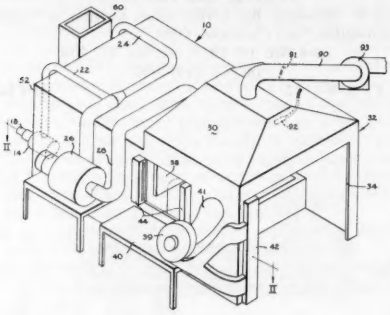
METHOD AND APPARATUS FOR MELTING METALS, ESPECIALLY SCRAP METALS

Khaled M. Habayeb, Wabash, Ind., assignor to Wabash Alloys Inc., Wabash, Ind.

Filed Sept. 18, 1973, Ser. No. 398,336
Int. Cl. F27b *19/00*
U.S. Cl. 266—33 S **7 Claims**

1. A reverberatory furnace having bottom, end, side and top walls and having a melting chamber portion in the lower region thereof, one of said end walls being provided with port means extending upwardly from the bottom and terminating near the top of said chamber portion, said chamber portion extending beyond said one end wall to form a charging well into which metal to be melted is charged, burner means positioned in the other end wall and a stack connected to said other end wall adjacent the burner means to convey exhaust gases from said furnace, an enclosure surrounding said charging well and including a dome at the top for collecting emissions given off by contaminated metal charged into the said charging well, blower means having suction means connected to said dome and having discharge means connected to said burner means to supply combustion gas thereto, said enclosure having at least one opening through which metal to be

charged into said charging well is conveyed into said enclosure from the outside, and an air curtain forming an air screen at

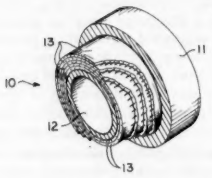


said opening to prevent the escape of emissions from said enclosure via the opening.

3,869,113
HIGH LOAD BUSHING

Thomas J. Dudek, Tallmadge, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed July 16, 1973, Ser. No. 379,666
Int. Cl. F16f 1/16
U.S. Cl. 267—57.1 R **23 Claims**



1. In a bushing comprising an outer rigid member, an inner rigid member spaced apart from said outer member and an integral elastomeric insert unit mounted in compression and in compressive elongation between said inner member and said outer member, the improvement wherein said insert unit comprises a composite of a convolution of a plurality of overlapping turns of a laminate having an array of flexible fiber cords disposed between layers of elastomer with said cords and said elastomer being bonded together to form said integral insert unit.

3,869,114
ROPE HAVING TENSION-CUSHIONING SHOCK ABSORBER

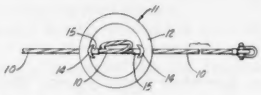
Herbert Schneider, Heimhausen, Germany, assignor to Rosan Enterprises, Newport Beach, Calif.

Filed Sept. 24, 1973, Ser. No. 399,947
Claims priority, application Germany, Sept. 26, 1972, 2247193
Int. Cl. F16f 1/46
U.S. Cl. 267—69 **14 Claims**

1. A rope having a tension-cushioning shock absorber, comprising:

a rubber element having high extensibility as well as resilience, the cross section of which is as thick or thicker than its width;

a rope passing through oppositely arranged holes in said rubber element, said rope being secured to opposite ends of said rubber element by a plurality of clamp means and a plurality of abutment means in a manner whereby the length of the rope section situated between said abutment means corresponds to slightly less than the maximum extensibility of said rubber element so that said rope

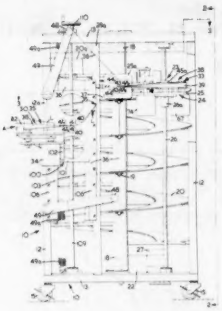


section is in loosely wound form when said rubber element is in normal or lightly loaded position whereby said rope section is completely stretched out when under a full tension load.

3,869,115
APPARATUS FOR TEMPORARY STORAGE OF ARTICLES

Ronald A. Barkley, P.O. Box 1118 Station H, Ottawa, Ontario, Canada

Filed Aug. 27, 1973, Ser. No. 391,097
Claims priority, application Great Britain, Aug. 29, 1972, 4004/72
Int. Cl. B65h 31/06
U.S. Cl. 271—147 **21 Claims**



1. Apparatus for storing articles, comprising a storage unit in the form of a helical shelf with a vertical axis and which is mounted for rotation around said axis, conveying means providing for movement of said articles seriatim along a path between the shelf and a stationary delivery point outside the shelf, which path remains substantially fixed in lateral position as the shelf rotates and which leads directly to different positions along the shelf dependent on the rotational position of the shelf, and means for providing relative vertical movement between the storage unit and a part of the conveyor means adjacent the shelf so as to maintain a constant relationship between said part of the conveyor means and the surface of the shelf as the shelf rotates.

3,869,116
DECREASING LOAD DEFLECTION MECHANISM

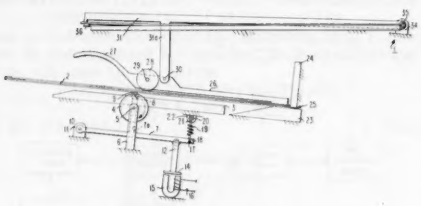
Elmer Leroy Bob Kroeker, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1973, Ser. No. 411,591
Int. Cl. B65h 1/06; B65l 3/16
U.S. Cl. 271—160 **9 Claims**

6. A card feed mechanism for applying a substantially uniform force to a card in contact with a card feed roller, comprising:

a card hopper having therein a stack of cards, a pressure plate applying a varying force to the card in said stack most remote from said card feed roller, and

means connected to said pressure plate for applying said varying force including means for producing a magnetic field with said connected means being force wise at-



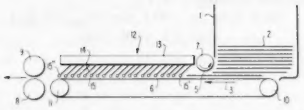
tracted to said means for producing said magnetic field in increasing amounts as cards are fed from stack by said card feed roller.

3,869,117

FLAT-ARTICLE SEPARATING APPARATUS FOR AN AUTOMATIC MAIL HANDLING SYSTEM AND THE LIKE

Shoichiro Yoshimura, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Apr. 24, 1973, Ser. No. 354,051
Claims priority, application Japan, Apr. 27, 1972, 47-42483
Int. Cl. B65h *3/46*
U.S. Cl. 271—270 **6 Claims**



1. A flat-article separating apparatus for an automatic mail handling system and the like, comprising:

an article transport path including a moving surface,

means for feeding flat articles along said article transport path, and

braking means installed on said article transport path for giving a braking force to said flat articles under transportation along said article transport path, said braking force being gradually increased toward the delivery and of said article transport path, said braking means including a braking surface juxtaposed to said moving surface whereby the uppermost of a stack of overlapping flat articles comes into substantial contact with the surface of said braking means and the lowermost of said stack comes into substantial contact with said moving surface thereby causing said stack to be progressively spread along the direction of movement of said moving surface, said moving surface and the surface of said braking means being made of materials which satisfy the relationship

$$K_1 > K_2 >> K_3$$

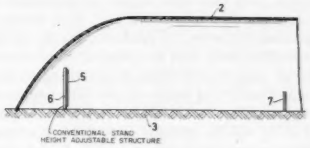
where K_1 is the coefficient of friction between said moving surface and a flat article to be separated, K_2 is the coefficient of friction between said braking surface and a flat article to be separated, and K_3 is the coefficient of friction between flat articles to be separated.

3,869,118

DEVICE FOR PROTECTING COVERINGS OF INFLATABLE TENNIS HALLS

Vladimir Kranz, Munich, Germany, assignor to Steinhof Marketing Corporation Ltd., represented by the General Partners, Steinhof Associated GmbH

Filed Mar. 20, 1973, Ser. No. 342,954
Claims priority, application Germany, Mar. 24, 1972, 2214505; Aug. 2, 1972, 2238037
Int. Cl. A63b *61/00*
U.S. Cl. 272—3 **8 Claims**



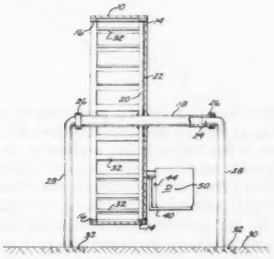
1. In combination with an inflatable structure to be used to cover a tennis court, said structure having substantially vertical side walls and a base; said base including said tennis court positioned thereon, said court being provided with end boundaries and side boundaries, said court being further provided with a net structure positioned across the center thereof; in addition to said net structure, a plurality of protection devices which are positioned around at least some of the boundaries of said tennis court each of said protection devices comprising a plurality of stands mounted to said base at a distance spaced inwardly from said side walls toward said court and a resilient skirt mounted on said stands disconnected from and spaced from said side walls and substantially parallel thereto, said skirt having a height sufficient to ordinarily protect said side walls from tennis balls being hit thereagainst.

3,869,119

PLAYGROUND AMUSEMENT DEVICE

Louise V. Oxley, 2236 McNab Ave., Long Beach, Calif. 90815

Filed June 17, 1974, Ser. No. 480,002
Int. Cl. A63g *1/14*
U.S. Cl. 272—38 **10 Claims**



1. A playground amusement device for children that includes:

a. a rigid cylindrical shell that defines a curved interior surface, with said shell having first and second open ends;

b. a tubular sleeve concentrically disposed in said shell and located on the axis of rotation thereof, said sleeve having first and second ends;

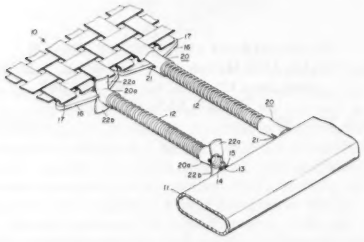
c. first means that rigidly connect said first end of said shell to said sleeve, with said first means obstructing entry into the interior of said shell through said first open end thereof;

d. at least one horizontal shaft on which said sleeve is rotatably mounted;
e. second means for rigidly supporting said shaft at a fixed elevation above the surface of said playground to permit said shell, sleeve and first means to rotate as an integral unit after a first child enters the interior of said shell through said second open end thereof and thereafter walks or runs relative to an upwardly inclined portion of said interior surface of said shell;
f. a seat for at least one second child adjacently positioned to said first means and outwardly disposed therefrom;
g. third means for pivotally supporting said seat from said first means, with said third means so positioned relative to said seat and first means that said third means is at all times positioned above the center of gravity of the combined weight of said seat and second child whereby the position of said second child is not tilted as said shell rotates, and said third means so pivotally supporting said seat from said first means that no portion of said seat or second child will be brought into pressure contact with said sleeve or second means as said shell, sleeve and first means are rotated as a unit by said first child; and
h. fourth stationary means disposed in said shell that may be grasped by said first child when walking or running relative to said shell to maintain his balance, said fourth means rigidly secured to said second means.

3,869,120
PROTECTIVE END COVERS FOR THE RESILIENT SUSPENSION MEMBERS OF TRAMPOLINE BEDS AND THE LIKE

George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation, Cedar Rapids, Iowa

Filed Apr. 22, 1974, Ser. No. 462,662
Int. Cl. A63b 5/18
U.S. Cl. 272—65 3 Claims

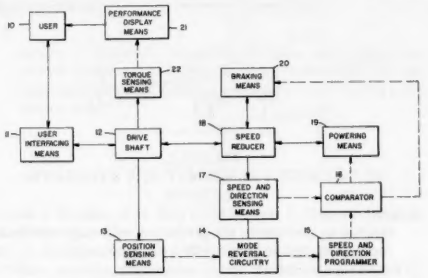


1. In apparatus for rebound of a performer in connection with trampoline, gymnastic and like activities, the apparatus having a frame, a flexible bed, and a plurality of elongated resiliently extensible members, each resilient member having a hook extending outwards from at least one of its opposite ends and releasably secured along one of the opposed marginal edges of the bed and the frame effective so that the bed is resiliently suspended from the frame, the hook terminating in an exposed end subject to contact by a performer, the improvement comprising: a protective sleeve of flexible material at said end of each resilient member, the sleeve having two portions, the first portion encompassing a portion of said end of the resilient member and resisting longitudinal movement of the sleeve relative to the resilient member, the second sleeve portion encompassing the hook at said member end portion, the wall of the second sleeve portion having a pair of slits therein extending in a longitudinal direction inwardly from the outer end thereof to form a flap portion effective to normally protectively overlie said hook end and to be foldable back toward the first sleeve portion to assist hooking or unhooking of the hook.

3,869,121
PROPORTIONED RESISTANCE EXERCISE SERVO SYSTEM

Evan R. Flavell, P.O. Box 6397, Astoria, Oreg. 94706

Division of Ser. No. 270,219, July 10, 1972,. This application July 5, 1973, Ser. No. 376,873
Int. Cl. A63b 21/24
U.S. Cl. 272—79 R 15 Claims

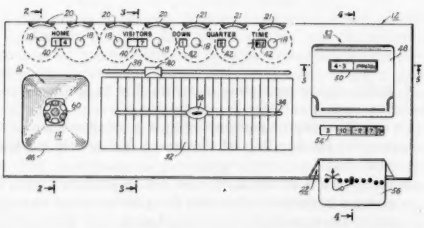


6. An exercise apparatus comprising
a movable device adapted for driving relation with a user, resistance means connected to said device for providing said device with exercise resistance by supplying driving power to said device in one direction of its movement and by supplying braking force to said device in the opposite direction of its movement, and
means connected to said device for automatically reversing the direction of movement of said device at each of two preset limits.

3,869,122
FOOTBALL GAME

Calvin L. Payne, Jr., Hastings-O-Hudson, and Vincent J. Gambello, New York, both of N.Y., assignors to Tudor Games, Incorporated, Brooklyn, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,901
Int. Cl. A63f 7/06
U.S. Cl. 273—94 R 4 Claims



1. In a football board game, a board surface adapted to have superposed thereon a simulated football field, a container for said board surface bearing a simulated football field and having a slidable ball marker thereon, said board surface providing a defensive strategy region having an action slot formed therein, said action slot having formed therein a plurality of holes arranged in a column along each longitudinal edge of said slot and having defensive play indicia disposed proximate to each of said holes, pegs adapted to be selectively inserted in said holes, offensive play cards adapted to be inserted in said slot having play result indicia disposed on both surfaces thereof with the indicia on one surface being different from the indicia on the other surface and having a shoulder formed along each lateral edge thereof, one lateral shoulder being at a different longitudinal location from that of the other lateral shoulder on each play card, whereby one of said play cards

may be inserted in said slot and its longitudinal penetration in said slot being determined by means of said pegs engaging one of said shoulders depending upon which side of the card is face up.

3,869,123

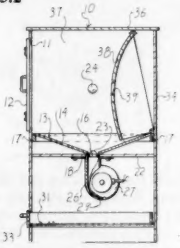
SHOOTING GALLERY WITH TARGET BALL SUPPORTED ON A COLUMN OF AIR

Bobby L. McDaniel, Columbus, Ga., assignor to Hugh P. Carter, Jr. and Woodford R. Thompson, Jr., both of Birmingham, Ala., part interest to each

Filed June 28, 1973, Ser. No. 374,472

Int. Cl. F41j *1/14*

U.S. Cl. 273—105.2 **1 Claim**



1. A shooting gallery comprising:

a. a bottom member having an opening therein inwardly of the edges thereof and an inwardly and downwardly sloping upper surface which slopes toward said opening,

b. means supplying and directing a moving stream of air upwardly through said opening at a velocity to move to an elevation above said bottom member,

c. a lightweight spherical target of a weight to move upwardly with said stream of air and float thereon above said bottom member to provide a floating target until struck by shot and moved out of the path of movement of said stream of air,

d. a deflector member extending upwardly and inwardly from at least one edge of said opening to an elevation above said opening in position to impart upward and inward movement to said target so that a target moving down said inwardly sloping upper surface moves into said moving stream of air,

e. an upstanding flexible sheet attached ajdacent opposite edges thereof to supports at a side of said floating target and extending across the path of movement of shot after passing said target with the length of said sheet being greater than the distance between said supports with the intermediate portion of said sheet being drawn toward said floating target by the upwardly moving stream of air so that shot are deflected downwardly onto said inwardly sloping upper surface and then move into said opening, and

f. there being an opening through said flexible sheet for receiving said target.

3,869,124

MATHEMATICAL BOARD GAME APPARATUS

Robert W. Stein, 4461 W. Sprague Rd., North Royalton, Ohio 44133, and Richard W. Stein, Litchfield, Ohio, assignors to said Robert, by said Richard

Filed Apr. 3, 1973, Ser. No. 347,564

Int. Cl. A63f *3/00*

U.S. Cl. 273—131 AC **3 Claims**

1. A numerical game comprising a game board having a series of demarcated areas arranged in horizontal rows and vertical columns, each of said demarcated areas having a separate, distinct number marked thereon, with said marked numbers each being different from the others and said numbers being organized in said rows and columns; at least two sets of a plurality of playing pieces each piece of a set having indicia marked thereon, each of said sets of pieces having means for distinguishing one set from all other sets; said indicia for a majority of said pieces being at least two identification numbers, which identification numbers each match a symbolically designated number on a selected demarcation area having a number which is a multiple of said identification number; and the other pieces having non-numerical indicia which may be said to match any symbolically designated number.

3,869,125

GAME WITH ARCUATE PIECES

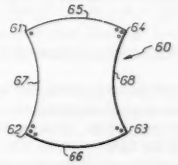
Marc Odier, 85 Boulevard Exelmans, Paris 16, France

Division of Ser. No. 47,969, June 22, 1970, Pat. No. 3,687,455. This application July 10, 1972, Ser. No. 270,294

Claims priority, application France, Jan. 9, 1970, 70.00840. The portion of the term of this patent subsequent to July 22, 1989, has been disclaimed.

Int. Cl. A63f *9/20*

U.S. Cl. 273—137 D **9 Claims**

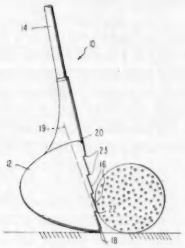


1. A game comprising at least one set of flat polygonal pieces, the pieces of said set being of identical size and shape, each piece having at each of its apices a value selected from M possible different values arranged in a predetermined order, the values of each piece being different from the values of each other piece of the set and the number of pieces of the set being sufficient for all the combinations of M values to be reproduced once and only once by the whole of the sequences carried by the pieces of the set, each piece having four apices and four sides, two of said sides being straight and the other two sides being arcuate, one said arcuate side being convex and the other said arcuate side being concave, both the said arcuate sides having the same length and radius of curvature.

3,869,126
GOLF CLUB FACE

Woodrow F. Thompson, Highway 80, West Forest, Miss. 39208

Filed Nov. 21, 1973, Ser. No. 417,836
Int. Cl. A63b 53/04
U.S. Cl. 273—175 1 Claim

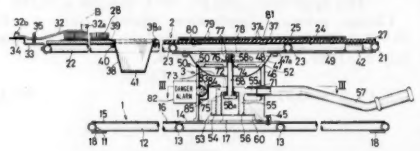


1. A golf club comprising a shaft and a head having a ball impact face thereon secured to said shaft, said face having a flat surface along the lowermost edge of the club face lying in an imaginery plane which defines the pitch of the club, a plurality of stepped flat surfaces disposed parallel to said plane and spaced progressively further from said plane as said stepped flat surfaces progress from said lowermost edge of the club face to the uppermost edge of said club face, and a plurality of risers interconnecting said flat surfaces with each riser being disposed at a maximum angle of 90° relative to the next highest flat surface to provide a plurality of edges adapted to bite into a golf ball upon impact to impart back spin to the ball.

3,869,127
GOLF-SHOT PRACTICING APPARATUS

Kiyotaka Kohori, No. 40-4,3-Chome, Aoyamadai, Suita, Japan

Filed Nov. 23, 1973, Ser. No. 418,566
Int. Cl. A63b 69/36
U.S. Cl. 273—195 B 11 Claims



1. A golf shot practicing apparatus comprising:

a. a base;

b. a support board above said base for a person to have golf ball hitting practice having thereon a part on which a ball will be placed and a part allowing the player to take a stance toward the ball;

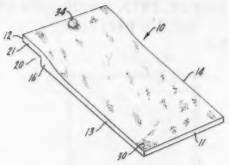
c. universal means by which the practice board above said base will be freely supported in any inclination in any direction and at any angle, said universal means including a support cylinder which is fixed to said base and a spherical plate which has a shape of the lower part of a hollow sphere and which is disposed upon the said support cylinder, while the peripheral rim thereof is fixed to the lower side of the said support board; and,

d. fixing means for said support board to fix the position thereof in a horizontal or inclined state inside the said spherical plate including a disc that presses the spherical plate to the upper side of the said supporting cylinder and a controlling device having a fixing cylinder that has a threaded inner periphery, a rotary elevating part that grapples with said fixing cylinder, a handle to rotate it and a tightening rod which passes through said spherical plate that connects said elevating part and the disc for pressing the spherical plate to said fixing cylinder.

3,869,128
DRIVING MAT FOR PRACTICING GOLF SHOTS

Reiji Ohashi, No. 25, 734-banchi, Osaka, Japan

Filed July 22, 1974, Ser. No. 490,487
Claims priority, application Japan, Dec. 6, 1973, 48-141250
Int. Cl. A63b 69/36
U.S. Cl. 273—195 A 2 Claims



1. A driving platform for practicing golf shots in the form of a mat having a body of flexible rubber-like material intended for resting on a flat supporting surface, the body being of smoothly tapering configuration having limited thickness at the rear end and substantially greater thickness at the front end, the front of the mat having a transversely extending relief on the underside to define a cantilevered lip several inches in extent which overhangs and is substantially uniformly spaced above the supporting surface, the top surface of the lip having means thereon for non-rolling support of a golf ball in striking position, the cantilevered lip being sufficiently thin so that when a golf club swung at the ball is swung too low, the lip, in the face of the impact, is free to yield by deflecting harmlessly downward toward the supporting surface thereby to minimize damage to the mat from the club head and to preclude any stinging or numbing sensation in the hands of the player.

3,869,129
SPEED CHANGER FOR PHONOGRAPH RECORD PLAYER

Arthur Katsumi Tateishi, 25 Warrender Ave., Apt. 202, Islington, Ontario, Canada

Filed Dec. 10, 1973, Ser. No. 423,068
Int. Cl. G11b 25/04
U.S. Cl. 274—9 B 11 Claims

1. In an apparatus for playing phonograph records, where said apparatus includes a turntable driving apparatus having a constant speed motor with a vertically oriented motor shaft and horizontally disposed idler driven from said shaft to drive said turntable, the contact of said idler with said motor shaft and turntable being at the periphery of said idler in each case; said motor shaft having first and second sections of different diameter to cause said turntable to be driven at a first or second speed upon driving contact by said idler with the respective one of said first or second shaft sections, said first section being disposed below said second section; an improved speed changer for said turntable driving apparatus, comprising:

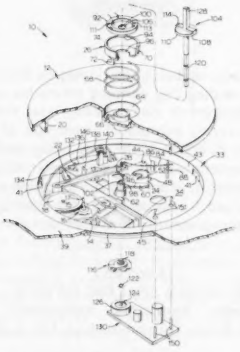
a horizontally disposed idler arm mounted for vertical movement from a first, lower, position to a second, higher, position said idler arm carrying said idler and having a bearing cam follower on the underside thereof; a cam plate mounted for swinging movement in a horizontal plane from a first to a second position and having a ramp-type cam formed on its upper surface and positioned for contact with the bearing cam follower on the underside of said idler arm, a shoulder portion on said cam plate disposed at a first elevation and to one side of the axis of rotation of said turntable, and a nose portion

on said cam plate disposed at a second elevation below said first elevation and remote from said shoulder portion; and

a control element having a dog formed on the underside thereof, said control element being mounted for rotation with said turntable and for vertical movement from a first, higher, position to a second, lower, position;

said dog being adapted to orbit around the axis of rotation of said turntable at a first elevation being the elevation of said shoulder portion of said cam plate when said control element is in its first position, and at a second elevation being the elevation of said nose portion of said cam plate when said control element is in its second position;

said idler arm being biased downwardly so that said bearing cam follower bears constantly against said ramp-type cam;



the first position of said cam plate being such that said dog and said nose portion interfere if said control element is in its second position, so that continued orbital movement of said dog about the axis of rotation of said turntable causes said cam plate to swing to its second position; and said first position of said cam plate being such that said idler arm and idler are in their respective first positions, and no interference of either said nose or said shoulder portion occurs when said control element is in its first position;

the second position of said cam plate being such that said dog and said shoulder portion interfere if said control element is in its first position, so that continued orbital movement of said dog about the axis of rotation of said turntable causes said cam plate to swing to its first position; and said second position of said cam plate being such that said idler arm and said idler are in their respective second positions, and no interference of either said shoulder or said nose portion occurs when said control elements is in its second position;

a control shaft being mounted for rotation independently of said turntable at the axis of rotation of said turntable, said control shaft being mechanically coupled to an electrical on-off switch for said turntable apparatus;

where a rotary cam is secured to said control shaft, said rotary cam having a first "off" cam position and a second "on" cam position, and a cam follower is mounted for horizontal movement against a post on the underside of said idler arm; and including an electrical contact arm biased towards a second electrical contact and towards said idler arm; so that when said rotary cam is rotated and the cam follower is no longer against said first cam position, said contact arm moves against said idler arm causing swinging movement thereof and sliding movement of said cam follower until said contact arm touches said second electrical contact.

3,869,130

SPINDLE ADAPTER APPARATUS

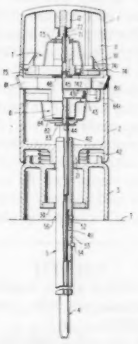
Toyonori Igata, Fukuroi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 11, 1973, Ser. No. 405,734

Claims priority, application Japan, Oct. 12, 1972, 47-102270

Int. Cl. G11b *17/16*

U.S. Cl. 274—10 S **9 Claims**



1. A spindle adapter apparatus comprising:

1. a hollow cylinder the exterior of which is shaped to engage the central aperture of records to be played;

2. a first stop plate mounted in said hollow cylinder and movable between a first position in which it protrudes through the external cylindrical periphery of said cylinder and a second position in which it is located entirely internally of the external cylindrical periphery of said hollow cylinder, whereby said first stop plate is adapted to support one or more records above a turntable when in its first position;

3. a second stop plate mounted in said hollow cylinder a distance below said first stop plate equal to the thickness of one record, said second stop plate likewise being movable between a first position in which it protrudes from the external cylindrical periphery of said cylinder and a second position in which it is located entirely internally of the external cylindrical periphery of said hollow cylinder, whereby said second stop plate is likewise adapted to support one or more records above the turntable when in its first position;

4. an operative shaft mounted in said hollow cylinder coaxially thereof, axially movable therein among a fully extended first axial position, an intermediate second axial position, and a fully contracted third axial position, and rotatably movable therein between first and second rotary positions;

5. means for operatively connecting said operative axis to said first and second stop plates so that,

a. when said first stop plate is in its first position, said second stop plate is likewise in its first position, and said operative shaft is moved by external means from said first axial position to said third axial position while being retained in said first rotary position, said first stop plate is moved from its first position to its second position, permitting one or more records to be slid down over said hollow cylinder to a position to be supported by said second stop plate,

b. when said first stop plate is in its second position, said second stop plate is in its first position, and said opera-

tive shaft is moved by external means from said third axial position to said second axial position while being retained in said first rotary position, said first stop plate is moved from its second position to its first position, wherein said first stop plate is in a position to support all but the bottom record of a plurality of records previously supported by said second stop plate,

c. when said first stop plate is in its first position, said second stop plate is likewise in its first position, and said operative shaft is moved by external means from said second axial position to said first axial position and from said first rotary position to said second rotary position, said second stop plate is moved from its first position to its second position, permitting a record supported by said second stop plate to be released, and

d. when said first stop plate is in its first position, said second stop plate is in its second position, and said operative shaft is moved by external means from said first axial position to said third axial position and from said second rotary position to said first rotary position, said second stop plate is moved from its second position to its first position and said first stop plate is moved from its first position to its second position, permitting any record discs supported by said first stop plate to slide down over said hollow cylinder to a position to be supported by said second stop plate.

3,869,131

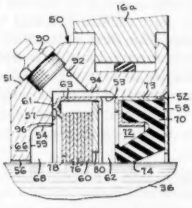
MULTIPLE SEAL CARRIER

William J. Derner, Indianapolis, Ind., assignor to FMC Corporation, San Jose, Calif.

Filed June 20, 1973, Ser. No. 371,923

Int. Cl. F16j *15/36, 15/34*

U.S. Cl. 277—21 **11 Claims**



7. A seal carrier for receipt in a housing to protect bearings mounted in the housing inwardly of said seal carrier, said seal carrier having an inner and outer seal therein spaced apart to define therebetween a first annular grease chamber in the carrier surrounding the shaft, an outer wall in said carrier defining a circular opening for said shaft, the outer seal spaced from said wall to define a second annular grease chamber in the carrier surrounding said shaft, and means to supply grease under pressure separately to said first annular grease chamber for penetration between the seals and the shaft on either side of said first chamber and to said second annular grease chamber for discharge through the gap between the outer wall and the shaft to flush dirt and abrasives from the seal carrier.

3,869,132

FIRE RESISTANT SEALING RING COMBINATION

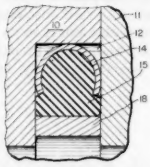
Dudley D. Taylor, Beltsville; Bernard J. Sadoff, Jr., Rockville, and Horace P. Halling, Laurel, all of Md., assignors to Pressure Science, Inc., Beltsville, Md.

Filed July 18, 1973, Ser. No. 380,200

Int. Cl. F16j *9/00*

U.S. Cl. 277—26 **9 Claims**

1. The combination of a pair of relatively movable flange members which define between them a cavity in which high pressures and temperatures may be encountered, a primary elastomeric sealing ring positioned in said cavity which provides a tight seal under normal operating conditions, a secondary deflectable metallic sealing ring situated in said cavity at a point remote from contact with the confined fluid which is under pressure, said metallic sealing ring having curved leg portions which at least partially surround a portion of said elastomeric sealing ring, and a metallic ring situated in said



cavity contiguous to said elastomeric ring on the side opposite of said metallic sealing ring defining means for confining the fluid and the elastomeric ring, whereby said last mentioned metallic ring prevents substantial expansion of said elastomeric ring in the direction of the fluid being confined so that when said elastomeric sealing ring expands under conditions of high temperature, it expands in the direction of said metallic sealing ring and forces said metallic sealing ring into a tighter sealing engagement with said cavity.

3,869,133

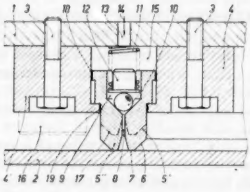
FLEXIBLE SEALING DEVICE

Alfred Pesendorfer, Rutihof/Ag, Switzerland, assignor to Brown Boveri Selzer Turbomaschinen AG, Zurich, Switzerland

Filed Apr. 9, 1973, Ser. No. 349,126

Int. Cl. F16j *15/40*

U.S. Cl. 277—27 **6 Claims**



1. In a flexible sealing device forming a separable joint between two components which comprises a series of metallic seal segments arranged in end-to-end relation, said seal segments being supported by one of said components and being pressed against the surface of the other component by spring means, the improvement wherein said series of seal segments operate within a gap formed between two holders which are secured to one of said components, wherein each said seal segment is composed of two halves separated by a longitudinally extending gap therebetween, wherein said spring means include loading springs and balls which serve to force the end surfaces of said seal segments into pressure contact with the other component and to force the sides of said seal segment halves laterally into pressure contact with the side of the corresponding holder, and wherein a sealing gas is caused to flow through the gaps between the halves of each seal segment to reach the seal junction between said seal segments and the surface of said other component.

3,869,134

PACKING SEALS

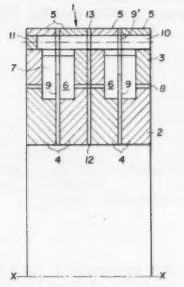
Hans Pittroff, Schweinfurt, Germany, assignor to SKF Industrial Trading and Development Company, Amsterdam, Netherlands

Filed Jan. 15, 1973, Ser. No. 323,660

Claims priority, application Germany, Jan. 19, 1972, 7201831

Int. Cl. B23p 11/00

U.S. Cl. 277—56 7 Claims



1. A seal unit for rods, shafts and the like comprising a pair of concentric rings annularly spaced from each other for the passage of lubricant, the outer ring having an annular groove along its edge facing the inner ring along its periphery and at least one bore along its periphery communicating with said groove and opening axially outwardly of said ring for discharge of lubricant, the inner ring being formed of at least a pair of supporting disks and a flexible deflecting spacer located therebetween and being adapted to extend radially into said annular groove spaced from the sides thereof to deflect the lubricant to the periphery thereof into said bore.

3,869,135

CONTROLLED LEAKAGE FACE TYPE SHAFT SEAL

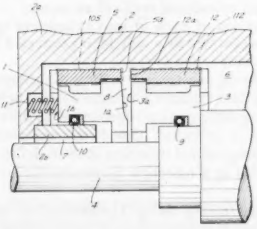
Herbert Diederich, Frankenthal/Pfalz, Germany, assignor to KSB Kernkraftwerkspumen GmbH, Frankenthal, Germany

Filed Mar. 25, 1974, Ser. No. 454,411

Claims priority, application Germany, Mar. 27, 1973, 2315190

Int. Cl. F16j 9/00

U.S. Cl. 277—80 10 Claims



1. In a fluid seal arrangement, the combination of a shaft member; a housinng member spacedly surrounding said shaft member and defining therewith a fluid-containing pressure chamber and a low-pressure area adjacent to the periphery of said shaft member, one of said members being rotatable about the axis of said shaft member; first and second sealing rings coaxial with said shaft member, located in said chamber and respectively secured to said housing member and said shaft member, one of said rings being movable axially of said shaft member and said rings having neighboring front surfaces defining an annular gap for the leakage of fluid from said chamber into said area, said one ring further having a rear surface facing away from the respective front surface and being exposed to the pressure of fluid in said chamber whereby the fluid contained in said chamber and acting on said surfaces maintains the width of said gap within a predetermined range as long as the fluid pressure in said chamber exceeds a preselected value; and first and second magnets respectively provided on said first and second rings and having similar poles adjacent to each other to urge said one ring away from the other of said rings and to thus prevent excessive reduction of the width of said gap when the pressure of fluid in said chamber is less than said preselected value.

3,869,136

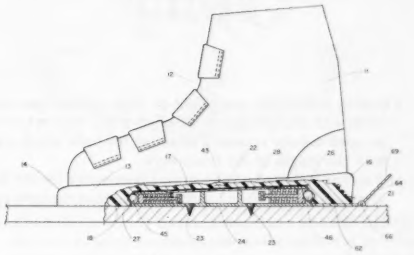
SKI RELEASE BINDING

Richard S. Jackson, 2897 S. Wolff St., Denver, Colo. 80236

Filed Nov. 28, 1972, Ser. No. 310,047

Int. Cl. A63c 9/08

U.S. Cl. 280—11.35 D 16 Claims



1. A release binding for holding a ski in operative position during skiing activities and for release of the ski when forces active between the skier's boot and the ski exceed desired levels comprising a latch mechanism mounted on the ski in position beneath the skier's foot, a housing for said mechanism having end walls at the front and rear thereof, movable latch elements extending outwardly of said housing at arcuately disposed positions, structural means intermediate the skier's foot and ski, said structural means providing a socket receptacle of shape corresponding to the shape of said housing and having downwardly expanding tapered end walls in position corresponding with the end walls of said housing for mating engagement about said housing whereby clearances between said housing and receptacle will be increased as they are moved one away from the other, catch recesses in said socket receptacle disposed for engagement by said latches, said latch mechanism being positioned adjacent the axis of maximum torsional strength for a skier's leg, with said catch recesses, latch elements and tapered end walls being arranged to provide for multi-directional and rotating separation of said ski,

and a raised surface on said housing for contact with a surface of the socket receptacle provided by said structural means for limiting frictional interference between said housing and socket receptacle.

3,869,137

PORTABLE STORAGE CART

Raymond R. Byrom, Rt. 1, Cleveland, Okla. 74020

Filed Aug. 17, 1973, Ser. No. 389,144

Int. Cl. B62b 1/16

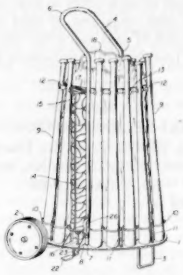
U.S. Cl. 280—47.19 5 Claims

1. A combination carrier and storage cart for athletic equipment such as used in baseball, including,

a platform extended in a horizontal plane,

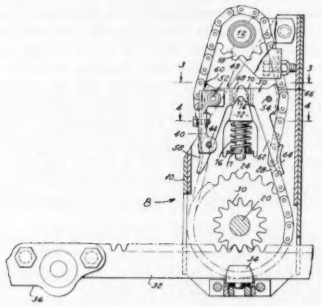
wheels mounted on the lower side of the platform by means of which the platform may be manually moved from place to place,

a handle mounted on the upper side of the platform to extend vertically,
a basic framework attached to the handle and platform and arranged to provide a cylindrical volume above the platform for storing articles of equipment,
brackets mounted on the outside of the framework for releasable securing elongated articles of equipment such as ball bats,



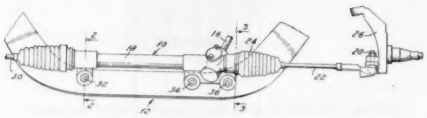
a storing framework comprised of rings spaced from each other with elongated rods attached to the rings in forming an open tubular retaining structure for balls which are in view the length of the framework,
and means mounted on the storing framework for the balls arranged for manually controlled release of the balls from storage.

3,869,138
STEERING DEVICE HAVING A CHAIN OPERATED STEERING GEAR ACTUATOR
William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 347,962, April 4, 1973,. This application July 1, 1974, Ser. No. 484,904
Int. Cl. B62d *3/02*
U.S. Cl. 280—93 **4 Claims**



1. A steering device for a motor vehicle including a steering gear actuator,
said steering gear actuator having an input sprocket constructed to be connected to a vehicle steering wheel,
said actuator having an output sprocket constructed to be connected to a steering gear;
a drive chain drivingly interconnecting said input and output sprockets,
a chain tensioner having a linkage system,
a pair of generally L-shape members supported by said linkage system,
spring means coupled to said members and urging each of said members into engagement with said chain at a pair of spaced locations,
said spring urged members biasing portions of said chain into generally ogee configurations.

3,869,139
STEERING GEAR MOUNTING
Raymond T. Gage, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 5, 1972, Ser. No. 312,414
Int. Cl. B62d *1/00*
U.S. Cl. 280—96 **1 Claim**



1. A rack and pinion steering gear for a motor vehicle and mounting means connecting said gear to a transverse vehicle frame component,
said rack and pinion steering gear having a housing containing a laterally displaceable rack,
said housing being arranged generally perpendicular in the plan view to the longitudinal axis of said vehicle,
said housing having a plurality of longitudinally oriented tubular mounting eyes,
a single cylindrical resilient element disposed in each of said eyes,
each of said resilient elements being of greater length then its respective eye and having fore and aft end portions that extend beyond the fore and aft ends of said eye,
a rigid sleeve disposed with in the center of each of said resilient elements,
each of said sleeves being of greater axial length than its respective eye and of lesser axial length than its respective cylindrical element when said element is in its unstressed state,
fore and aft thrust washers positioned at the ends of said resilient element and in butting engagement therewith,
a longitudinally oriented bolt extending through each of said sleeves and through each of said thrust washers exerting a longitudinally directed compressive load on each of said cylindrical resilient elements,
said end portions of each of said cylindrical resilient elements being formed into radial flanges at said fore and aft ends of its respective eye,
said sleeves being constructed to limit the compressive load exerted on said resilient elements by said bolts,
said mounting means being constructed to provide a lower spring rate to deflection of said rack and pinion steering gear in a longitudinal direction than to deflection of said steering gear in a direction perpendicular to the axis of said bolts,
said mounting means being constructed to substantially prevent pivotal displacement of said steering gear about a longitudinally extending pivot axis.

3,869,140
REAR SUSPENSION FOR MOTOR VEHICLES
William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 5, 1972, Ser. No. 312,421
Int. Cl. B60g *11/36*
U.S. Cl. 280—124 R **17 Claims**

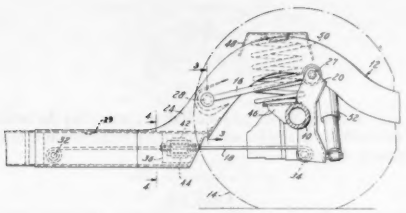
1. A suspension system for a motor vehicle having a chassis frame and an axle housing,

said suspension system including a plurality of suspension links interconnecting said axle housing and said frame,

at least one of said links comprising a leaf spring,

pivot means connecting one end of said spring to said frame, pivot means connecting the other end of said spring to said axle housing,

deflection limiting means engaging a portion of said spring intermediate its ends and vertically spaced apart from an adjacent portion of said frame,



said deflection limiting means being constructed to permit unrestricted vertical movement of said portion of said leaf spring relative to said portion of said frame for a predetermined vertical distance,

said deflection limiting means being constructed to restrain vertical movement in at least one direction of said portion of said spring relative to said portion of said frame that exceeds a predetermined amount.

3,869,141

VEHICLE SUSPENSION SYSTEM

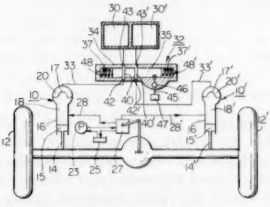
Naganori Ito, and Hiroshi Aikawa, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 20, 1973, Ser. No. 343,027

Claims priority, application Japan, Mar. 27, 1972, 47-29700

Int. Cl. B60g *17/04*

U.S. Cl. 280—124 F **12 Claims**



1. A vehicle suspension system comprising:

first and second suspension struts each formed of a hydraulic shock absorber and a hydropneumatic spring means provided with a gas chamber;

levelling means comprising a fluid pump fed from a fluid reservoir to pump fluid under pressure through at least one levelling valve responsive to the vehicle level and arranged to communicate the fluid reservoir and the shock absorbers of the first and second suspension struts to automatically maintain the level of the vehicle constant independently of variation in vehicle load;

first and second auxiliary gas chamber means;

normally open valve means connecting the first auxiliary gas chamber means to the gas chamber of the spring means of the first suspension strut and also connecting the second auxiliary gas chamber means to the gas chamber of the spring means of the second suspension strut; and

sensing means to sense a horizontal component of force exerted on the vehicle, the sensing means being operatively connected to the valve means so as to close the valve means and isolate the first and second auxiliary gas chamber means from the respective gas chambers of the spring means of the first and second suspension struts in response to the horizontal component of the force being sensed.

3,869,142

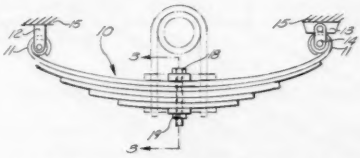
VEHICLE SPRING ASSEMBLY AND METHOD OF CLAMPING SAME

George L. Radamaker, Warren, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 23, 1973, Ser. No. 408,701

Int. Cl. F16f *1/20*

U.S. Cl. 280—124 R **8 Claims**



1. A vehicular suspension assembly comprising:

a. a plurality of spring leaves disposed in a stacked relationship and adapted for attachment to the vehicle at the ends thereof, each of said leaves having an aperture located in the central region thereof adapted for axle attachment, and

b. clamping means operative to exert a clamping force on said leaves to substantially prevent flexing of said leaves for a predetermined length in the region adapted for axle attachment, said means including,

i. plate means adjacent the outer of said spring leaves, said plate means being substantially non-flexible, and

ii. tension means received through each of said apertures in said spring leaves, said tension means being operative to cause said plate means to exert said clamping force on said leaves.

3,869,143

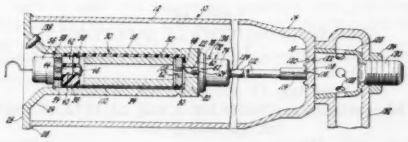
INFLATOR FOR OCCUPANT RESTRAINT CUSHION

Richard L. Merrell, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 25, 1973, Ser. No. 373,388

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **9 Claims**



1. An inflator comprising, in combination, a pressure vessel containing pressure fluid and provided with a normally closed outlet controlling flow of the pressure fluid to an occupant restraint cushion, a combustion chamber within the pressure vessel and including an outlet open to the pressure vessel, a gas generating charge of propellant within the combustion chamber, pressure sensor means overlying the combustion chamber outlet for sensing the pressure level in the pressure vessel, means sealing the pressure sensor means to the com-

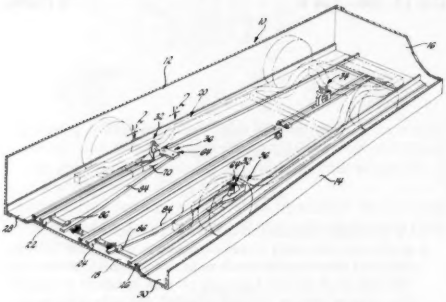
bustion chamber to normally close the outlet thereof to the pressure vessel, means for initiating the charge of propellant to generate high pressure, high temperature gas and move the pressure sensor means from the outlet as the sealing means ruptures to thereby open the outlet from the combustion chamber to the pressure vessel, and means operative upon movement of the pressure sensor means for opening the pressure vessel outlet to the cushion.

3,869,144

LATCHING MECHANISM FOR SECURING A VEHICLE TO A TRANSPORTER

Walter Cwycyshyn, Detroit, and Anthony Buccellato, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1973, Ser. No. 414,334
Int. Cl. B60p *7/08*
U.S. Cl. 280—179 R **3 Claims**



1. A latching mechanism for a vehicle tie-down device having an upper end formed with a projecting member which is received within an aperture in the side of a vehicle frame and has a lower end formed with a shoe member which is received by an elongated guide rail, comprising a base member located adjacent said guide rail, a lock lever formed with a pair of spaced stop surfaces, means connecting the lock lever to said base member for movement between a first position wherein said stop surfaces are located fore and aft of said tie-down device so that said tie-down device is restrained from movement along the longitudinal axis of the guide rail and a second position wherein said stop surfaces are spaced from the tie-down device to allow movement of said tie-down device along said longitudinal axis, means mounted on the lock lever for engaging the tie-down device and causing the latter to be forced laterally against the side of the frame and raised vertically against the guide rail to maintain the tie-down device in a fixed position when the lock lever is in the first position, and means for locking said lock lever in said first position.

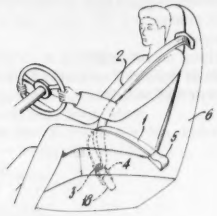
3,869,145

SELF-APPLYING VEHICLE SAFETY BELT

Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co. Ltd., Tokyo, Japan

Filed Aug. 13, 1973, Ser. No. 388,000
Claims priority, application Japan, Aug. 23, 1972, 47-83698
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **9 Claims**

1. A vehicle safety belt system for use with a vehicle seat comprising an inflatable flexible tubular lap belt preformed to assume a longitudinally arcuate shape upon inflation thereof, said belt having a first end anchored to a first side of said seat, a coupling member secured to the second end of said belt opposite to said first end, a coupling device positioned at a second side of said seat opposite said first side for releasably engaging said coupling member, a source of compressed air, and control means responsive to the occupation of said seat for connecting the interior of said belt to said compressed air source to inflate and extend said belt from said seat first side



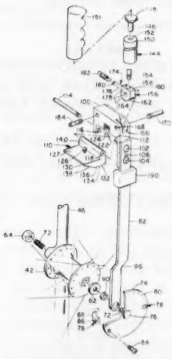
to said coupling device and thereafter connecting the interior of said belt to exhaust in response to said belt extending to said coupling device.

3,869,146

OCCUPANT ACTUATED MEANS FOR PROPELLING, STOPPING, DIRECTING, AND CURB HOPPING A WHEELCHAIR

Donald L. Bulmer, 15404 63rd Ave., Bothell, Wash. 98011

Filed Feb. 8, 1973, Ser. No. 330,865
Int. Cl. B62m *1/14, 29/02*
U.S. Cl. 280—242 WC **6 Claims**



1. A self-propulsion subassembly, which is self-contained and adjustable, for installation in pairs on wheeled carriers such as wheelchairs and wheelstretchers for the occupant to use in applying control forces to large wheels, comprising:

a. a stroke handle for radial operation having a hole at its bottom to be fitted over a wheel bearing bolt positioned horizontally on a wheeled carrier and a hole near its top to adjustably receive a head frame;

a head frame adjustably secured with its fasteners at the hole of the stroke handle in a transverse position and formed both with a receiving bottom, and with holes to receive fasteners and a pivot pin;

c. a driving dog positioned to contact a large wheel of a wheeled carrier and pivotally installed in the receiving bottom of the head frame by being formed with a transverse hole in which it has a pivot pin which in turn is secured in holes in the head frame;

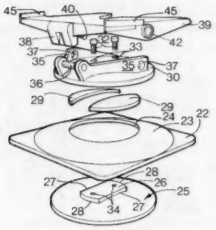
d. a handle secured to the head frame; and

e. a braking shoe material placed on the stroke handle in a position to be transversely moved against a large wheel of a wheeled carrier to create a braking force.

3,869,147
ARTICULATED VEHICLE COUPLING

Timothy Selwyn Fry, Dunchurch, England, assignor to Bartel Engineering Limited, London, England

Filed July 16, 1973, Ser. No. 379,704
Claims priority, application Great Britain, July 21, 1972, 34162/72
Int. Cl. B62d 53/06
U.S. Cl. 280—438 R **10 Claims**



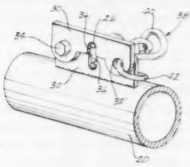
1. A coupling for connection between a tractor and a semi-trailer in an articulated vehicle of which the tractor includes a chassis and at least one front and one rear axle carried by said chassis, the coupling including a fifth wheel coupling plate to be mounted on one of the tractor and the semi-trailer to rotate relatively thereto about an upright axis, pivot means defining said upright axis, a domed plate having a central aperture therein, a complementary concave element-engaging the upper surface of the domed plate, a complementary convex element engaging the lower surface of the domed plate, means extending through the aperture in the domed plate restraining the domed plate and the complementary concave and convex elements from axial separation one from another, means connecting together the complementary concave element and the fifth wheel coupling plate, the domed plate defining an arcuate path along which the complementary concave element and the fifth wheel coupling plate are slidable relatively to the domed plate and providing at the centre of curvature of said arcuate path an axis of vertical articulation between the tractor and the semi-trailer, said axis of vertical articulation positioned between the front and rear axles of the tractor and below the chassis thereof, and means constraining the fifth wheel coupling plate to move with the semi-trailer on relative pivotal movement between the tractor and the semi-trailer about said upright axis, the means connecting together the complementary concave element and the fifth wheel coupling plate including a two part latch, one of the parts of the latch being carried by the fifth wheel coupling plate and the other of said parts of the latch being carried by the concave element.

3,869,148
HAULING HITCH

William R. Iehl, Waterloo, Iowa, assignor to Construction Machinery Company, Waterloo, Iowa

Filed Aug. 10, 1973, Ser. No. 387,525
Int. Cl. B60d 1/12
U.S. Cl. 280—457 **5 Claims**

1. A hauling hitch comprising,
an elongated tongue element having forward and rearward ends,
means on the forward end of said tongue element for connection to a towing vehicle,
a chain locking means on said tongue element rearwardly of the forward end thereof,
a safety chain secured at one of its ends to said tongue element, said safety chain extending forwardly from said tongue element to extend around an anchor on the towing vehicle thence rearwardly towards said locking means,
said locking means comprising means for selectively securing said safety chain thereto,
said locking means comprising a first jaw member secured to said tongue element, a second jaw member pivotally

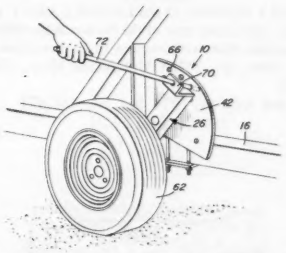


secured to said first jaw member and movable between open and closed positions with respect to said first jaw member, said chain being selectively received between said jaw members, and a keeper selectively maintaining said second jaw member in its said closed position.

3,869,149
TRAILER TONGUE SPARE-LANDING WHEEL STRUCTURE

Ronald O. Dixon, Rt. 9, Box 430, Albuquerque, N. Mex. 87105

Filed Sept. 12, 1973, Ser. No. 396,371
Int. Cl. B60s 9/02
U.S. Cl. 280—475 **11 Claims**



1. In combination with a trailer frame having a tongue adapted to be hitched to a towing vehicle, a jack wheel assembly mounted on the frame, including wheel carrier means pivotally mounted by the frame for displacement between a retracted position elevated above the ground and a plurality of load supporting positions, ground engaging wheel means rotatably mounted by the carrier means for engagement with the ground in the load supporting positions of the carrier means, releasable locking means for holding the carrier means in each of said load supporting positions, and jack means mounted on the carrier means and engageable with the locking means for incremental displacement of the carrier means under load relative to the frame between said load supporting positions.

3,869,150
MUD DIVERTING KELLY SAVER SUB

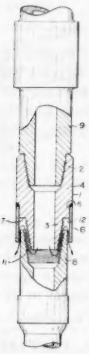
William Henry Brown, 13055-149 St., Edmonton, Alberta, Canada

Filed Feb. 16, 1973, Ser. No. 333,407
Int. Cl. F16l 55/00
U.S. Cl. 285—13 **3 Claims**

1. In a sub for use with the kelly joint of a drilling string, said sub having a body member comprising at its lower end a shoulder and a tapered threaded pin of reduced diameter extending downward from the shoulder,

the improvement which comprises:

an imperforate circumferentially continuous tubular member concentric with the body member; and means permanently attaching said tubular member to said body member, whereby said tubular member forms a part of said sub, said tubular member extending below the shoulder and overlapping at least a portion of the threads to provide a deflecting surface for escaping drilling mud.

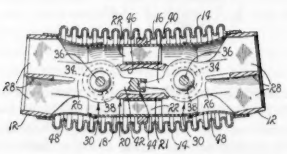


3,869,151

INTERNALLY SUPPORTED FLEXIBLE DUCT JOINT

James Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention by, and Ralph F. Kuhn, Jr., 24723 Mulholland Hwy., Calabasas, Calif. 91032

Filed Apr. 16, 1974, Ser. No. 461,477
Int. Cl. F16l *27/04*
U.S. Cl. 285—114 **7 Claims**



1. In a lightweight, flexible duct joint of the type including a convoluted, tubular bellows having opposite end portions adapted to be connected with adjacent segments of a pressurizable duct, whereby the duct joint operatively is subjected to internal pressure and angular deflections, the improvement comprising:

means for controlling angular deflection imparted to said tubular bellows including:

A. an elongated, rigid base disposed internally of the bellows and having an end portion disposed adjacent to each of the opposite end portions of said bellows,

B. means including a plurality of angularly related struts projected from said base for connecting the bellows with the base, and

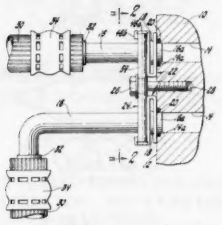
C. means for interconnecting the opposite end portions of said bellows with the adjacent end portions of said elongated base including a pair of annular supports, each being affixed to one end portion of said bellows in concentric relation therewith, a pair of connecting bodies, each being rigidly affixed to one of said annular supports and pivotally connected to one end portion of said elongated base, and motion control means affixed to said connecting bodies for limiting angular motion imparted to said annular supports relative to said base.

3,869,152

TUBE MOUNTING ASSEMBLY

Patsy DeVincent, Dayton, and James R. Steck, Brookville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1974, Ser. No. 455,049
Int. Cl. F16l *39/00*
U.S. Cl. 285—137 R **4 Claims**



1. A tube mounting assembly for securing N number of tubes to an accessory housing, the accessory housing having an N number of bored passages to receive the tubes, each of the tubes having an annular upset bead adjacent one end of the tube with a pilot tube portion extending therefrom for insertion into one of the bored passages, said tube mounting assembly including a fold-over clamp for each tube having a first leg and a second leg connected at one end by an integral bight, said first leg having an aperture therein to receive the pilot tube portion of a tube and the second leg having a slot therein of a size to slidably receive the tube, said fold-over clamp being secured to a tube with the pilot tube portion of a tube inserted into the aperture in said first leg and with the bead of the tube securely sandwiched between said first leg and said second leg, an O-ring positioned to encircle the pilot tube portion of each tube in abutment against said first leg of said fold-over clamp associated with the tube and, a split flange connector consisting of two brackets of identical shape, said brackets each having an N number of tube receiving slot openings extending from one side thereof to receive said N number of tubes, said brackets being positioned in opposed, overlapping, fixed relation to each other with the N number of tubes positioned in said slots whereby the tubes are entrapped between said pair of brackets, said brackets being positioned on the opposite side of each fold-over clamp from said O-ring associated therewith, each said fold-over clamp further including positioning tab means for engagement with said brackets to lock each said fold-over clamp and therefore a tube associated therewith against rotation relative to said brackets, said brackets having aperture means therethrough to receive fastener means for securing said brackets to the accessory housing with said clamp and O-ring sandwiched therebetween with said O-ring in sealing engagement with said first leg of the fold-over clamp and the accessory housing.

3,869,153

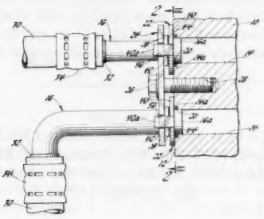
DOUBLE TUBE MOUNTING ASSEMBLY

Patsy De Vincent, and John F. Wiechart, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed July 22, 1974, Ser. No. 490,384
Int. Cl. F16l *39/00*
U.S. Cl. 285—137 R **4 Claims**

1. A tube mounting assembly for securing N number of tubes to an accessory housing, the accessory housing having an N number of bored passages to receive the tubes, each of the tubes having an annular upset bead adjacent one end of

the tube with a pilot tube portion extending outboard from one side thereof for insertion into one of the bored passages, a yoke for each tube, each yoke having a centrally apertured disc encircling said pilot tube portion on one of said tubes in abutment against the outboard side of said bead, an annular weld means around said bead securing and sealing said bead to said disc, an O-ring positioned to encircle the pilot tube portion of each tube in abutment against said disc of said yoke associated with said tube and, a mounting plate having an N number of tube receiving slot openings on opposite ends thereof with one of the N number of tubes positioned in each of said slots, said mounting plate further including an N number of opposed sets of locking slots on opposite sides thereof for each said slot aligned with the axis of one of said tubes



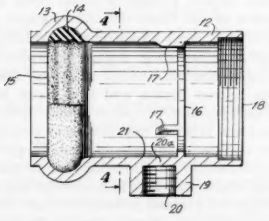
positioned in said slot, said mounting plate being positioned on the opposite side of said bead in abutment thereagainst from said disc of said yoke associated therewith, each said yoke further including spaced apart legs extending axially from said disc for engagement with one of said sets of locking slots to lock said yoke and therefore said tube associated therewith against rotation relative to said mounting plate, each said leg including a leg portion bent over to engage the opposite side of said mounting plate from said disc, said mounting plate having aperture means therethrough to receive fastener means for securing said mounting plate to the accessory housing with each said yoke and each said O-ring sandwiched therebetween with said O-ring in sealing engagement with said disc of said yoke associated therewith and the accessory housing.

3,869,154

BELL-SHAPED PIPE COUPLING HAVING CONNECTIONS FOR HOUSEHOLD SERVICE AND THE LIKE

Rodolfo Leuze Sanchez, Calle 8 no. 1-B, Fracc. Ind., Alce Blanco, Naucalpan de Juarez, Estado De Mexico, Mexico

Continuation-in-part of Ser. No. 175,088, Aug. 26, 1971, abandoned. This application July 12, 1973, Ser. No. 378,639
Claims priority, application Mexico, Oct. 28, 1970, 123041
Int. Cl. F16l *41/00*
U.S. Cl. 285—156 **3 Claims**



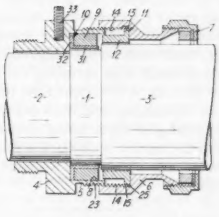
1. A pipe coupling adapted to form connections for household service piping and the like, comprising a tubular body having an external annular enlargement in a first one of its ends in axial alignment with an internal annular hollow recess, an elastomeric material sealing ring being positioned in said recess and adapted to sealingly engage the periphery of a pipe inserted in said end of the tubular body, an annular radially inwardly projecting protuberance and a plurality of annularly spaced longitudinal ribs extending therefrom being formed in said coupling, at least one cylindrical connector boss integrally formed with and radially extending from said coupling, said annular protuberance being positioned to one side of said boss and said ribs extending axially into the plane of said connector boss so as to provide space for piping inserted into said coupling and to prevent said piping from blocking said boss, said connector boss being angularly offset relative to said longitudinal ribs, and a radially inwardly extending blind hole formed in said connector boss, said blind hole extending inwardly so as to form an inner wall coextensive with and of generally the same thickness as the wall thickness of said tubular body and adapted to be drilled through so as to form a flow connection between the interior of said pipe coupling and a household service piping said blind hole in said connector boss comprising an internal thread extending between the outside of said boss and the bottom of said blind hole adapted to be engaged by a complementary threaded household service piping.

3,869,155

CABLE GLANDS

John Blundell Hutchison, Formby, England, assignor to British Insulated Callender's Cables Limited, London, England

Filed Dec. 8, 1972, Ser. No. 313,410
Claims priority, application Great Britain, Dec. 14, 1971, 57932/71
Int. Cl. F16l *5/02*
U.S. Cl. 285—158 **7 Claims**



1. A sealing gland for a cable having at least one metallic sheathing layer comprising: a first tubular gland member made of metal; a second tubular gland member aligned and in screw-threaded engagement with the first gland member; between said first and second gland members and aligned with them a third tubular gland member captively engaged with said second gland member and freely rotatable with respect thereto; and between said first and third gland members a composite annular seal comprising an elastomeric ring and insert of a soft metal which insert includes a tubular first part within the bore of said elastomeric ring and a second part located between said ring and said first gland member.

3,869,156
JOINTS

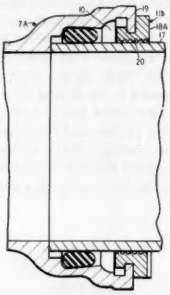
John Leslie O'Brien, 60 Rembrandt Dr., Middle Cove, New South Wales 2068; Bryan Finnimore, 126 Boundary Rd., Pennant Hills, New South Wales 2120, and Dallas John Arthur Hogg, 30 Thorney Rd., Fairfield, New South Wales, 2165, all of Australia

Filed Apr. 10, 1973, Ser. No. 349,840

Claims priority, application Australia, Apr. 10, 1972, 8546/72

Int. Cl. F16l *19/06*

U.S. Cl. 285—374 **3 Claims**



1. A socket and spigot pipe joint wherein the socket has an axially inward shoulder having an inner diameter smaller than the outer diameter of the spigot limiting axially inward movement of the spigot, a resilient sealing ring in the space between the spigot and socket compressed between the inside of the socket and the outside of the spigot and means for detachably retaining the spigot in the socket, said means comprising at least one radially inward circumferential flange on the outer end of the socket, each said at least one flange having at least one circumferential section, the free inward edge of each flange section being widely spaced from the outside of the spigot at one end and converging towards the outside of the spigot towards its other end, and a separate circumferential wedge having an outer portion and a depending portion extending therefrom received in the wide space of each said at least one flange, each said wedge depending portion being channelled along its outer edge receiving the respective flange and having a thickness, with respect to the radius of said spigot, greater at the trailing end than the leading end, each said wedge depending portion being circumferentially displaceable towards the narrow space of the respective flange so as to wedge the socket and spigot together against relative axial displacement.

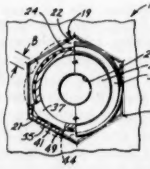
3,869,157
FAN WHEEL ASSEMBLY

Gerald P. Jolette, Kalamazoo, Mich., assignor to The Brundage Company, Kalamazoo, Mich.

Filed Jan. 27, 1972, Ser. No. 221,181

Int. Cl. B60b *27/06*

U.S. Cl. 287—52.04 **6 Claims**



1. In a plate and hub assembly for a blower wheel, the combination comprising:

a radially extended plate having an axially stepped, substantially polygonal central portion and a central opening in said central portion;

an annular hub having a substantially polygonal end portion of substantially similar configuration to said stepped portion of said plate and further having an annular flange extending axially from said end portion, said hub and plate being telescoped, the hub end portion and annular flange being received in the plate stepped central portion and central opening, respectively;

annular resilient isolator means snugly interposed between opposed surfaces of the hub and plate for reducing vibration transfer therebetween, said substantially polygonal portions of said hub and plate being close spaced and sandwiching a portion of said isolator means for preventing significant relative circumferential movement between said hub and plate, said annular flange extending radially outwardly at least at its outer end to firmly axially lock said plate and isolator means on said hub.

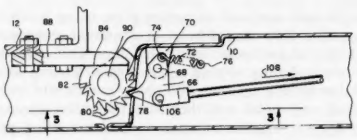
3,869,158
SAFETY LATCH MECHANISM FOR VEHICLE DOORS

Joseph Ciciulla, 1027 10th Ave., Yuma, Ariz. 85023

Filed Mar. 26, 1973, Ser. No. 344,649

Int. Cl. E05c *17/50*

U.S. Cl. 292—35 **8 Claims**

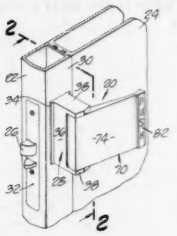


1. In a safety latch mechanism for vehicle doors; a door having inner and outer sides; a frame for said door; a hinge means pivotally connecting said door to said frame; a first latch means comprising first and second cooperably engageable latch elements on said door and frame respectively; door handle mechanism including manually operable latch release means coupled to said first latch element and adaped to disengage it from said second latch element on said frame to allow pivotal movement of said door relative to said frame; said hinge means including first and second hinge parts having a common pivotal axis and pivotally connecting together about said axis; said first hinge part fixed to said door and said second hinge part fixed to said frame; a hinge detent means havng an arcuate row of spaced apart detent abutments desposed concentrically about said pivotal axis; and releasable hinge latch means engageable with said detent abutments in correspondence with various pivoted partially open positions of said door relative to said frame for retaining said door in any one of said positions; force imposing means tending to maintain said hinge latch means in engagement with said detent abutments; and connector means coupling said manually operable latch release means and said hinge latch means whereby manual operation of said manually operable release means operates and releases said first latch means to release said door from said frame and whereby said hinge latch means is concurrently released to allow said hinge parts to pivot relative to each other and whereby said force imposing means causes said hinge latch means to hold said door in any one of various pivoted positions when said manually operable latch means is not manually operated thus preventing accidental pivotal opening movement of said door relative to said frame when said first latch means has been released and said door is partially opened relative to said frame.

3,869,159
PUSH-PULL LOCK ACTUATOR

Charles L. Eads, Palm Springs, Calif., assignor to Adams Rite Manufacturing Company, Glendale, Calif.

Filed Aug. 10, 1973, Ser. No. 387,304
Int. Cl. E05c *15/02*
U.S. Cl. 292—92 **7 Claims**



1. A latch operating mechanism adapted to be mounted on a hinged door and operatively coupled with a latch of the type typically mounted in the free edge or nose of the door and requiring rotary actuation to retract the latch bolt thereof, comprising:

a. a housing affixed to the door and having laterally spaced apart first and second side walls;

b. a first means carried by said housing including a rotary spindle operatively connected with the latch;

c. a second means mounted within said housing proximate said first means and comprising a driver plate removably mounted within said housing proximate said first side wall thereof and having a slot formed therein adapted to operatively receive a driving pin provided on said first means, said driver plate being movable laterally within said housing toward said second side wall of said housing in a plane substantially parallel to the plane of the door;

d. a paddle operator pivotally carried by said housing comprising:

1. a lever portion extending outwardly from said housing in a first direction; and

2. a driving ear extending into said housing and so constructed and arranged as to be operatively received in the slot formed in said driver plate whereby pivotal movement of said paddle operator will impart lateral movement to said driver plate of said second means causing rotation of said rotary spindle of said first means in a first direction; and

e. biasing means comprising spring members disposed between said driving plate and said housing so as to yieldably resist lateral movement of said driver plate within said housing.

3,869,160
LATCHING DEVICE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and George W. Ulrich, 2815 Devonshire Dr., Florissant, Mo. 63033

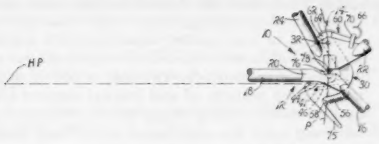
Filed May 2, 1973, Ser. No. 356,555
Int. Cl. E05c *19/10*
U.S. Cl. 292—108 **9 Claims**

1. An improved latching device comprising:

means including a substantially rigid receiver;

latching means for capturing the receiver when the receiver and latching means are in juxtaposition including a bracket, a restraining hook supported by said bracket for pivotal movement into restraining engagement with said receiver, and biasing means for continuously urging the hook into restraining engagement with said receiver;

support means supporting said latching means and said receiver for relative movement into juxtaposition;

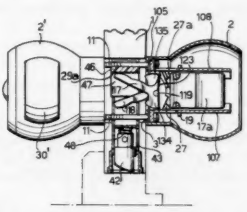


said latching means including a protuberance mounted on said bracket having a distal surface of a spherical configuration and means defining within said receiver a conical seat for receiving said protuberance.

3,869,161
PUSH-BUTTON OPERATED SWITCH, MORE PARTICULARLY FOR DOORS AND THE LIKE

Giuliandrea Meroni, Nova Milanese, Italy, assignor to Cicala Establishment, Vaduz, Liechtenstein

Filed Dec. 8, 1972, Ser. No. 313,387
Claims priority, application Italy, Mar. 15, 1972, 21872/72; July 27, 1972, 27529/72
Int. Cl. E05c *1/12*
U.S. Cl. 292—166 **6 Claims**



1. A door latch mechanism of the type having a push-button control comprising a latch movably mounted in a door, at least one hollow knob having a central axis, means for nonrotatably securing said knob to a door with said central axis disposed perpendicular to the door, supporting means secured within said knob, latch control means pivotally mounted on said supporting means and operatively engaged with said latch, aperture means in said knob, a push-button movably mounted in said aperture for movement substantially transverse to said central axis and disposed in operative engagement with said latch control means, said latch control means being comprised of a pair of substantially scissors-like levers mounted on a common pivot carried by said supporting means, one end of each of said levers being operatively associated with said push-button and the other end of each of said levers being operatively engaged with said latch and resilient means engaging said levers to oppose spreading out of the levers.

3,869,162
LOCK ARRANGEMENT FOR BOX CAR DOORS

James J. Schuller, Chicago, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Feb. 22, 1973, Ser. No. 334,552
Int. Cl. E05c *19/08*
U.S. Cl. 292—283 **3 Claims**

1. A device for locking relatively sliding doors of a railway car in a closed position, said device comprising

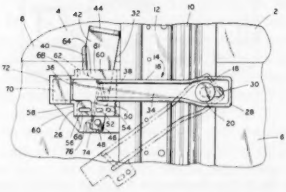
a hasp one end of which is pivotally mounted to the front of a first door for multiplanar pivotal movement and having a shank and a cam-shaped free end provided with a rear

bevel edge portion that extends downwardly of the hasp and inwardly towards the pivotally mounted end of said hasp,

a keeper mounted on the front of the other door and being comprised of a backing means and a bracket element connected to said backing means, opposed portions of said bracket element and said backing means defining an opening for receiving the cam-shaped end of said hasp, the opposed portions of said bracket element and said backing means slidably engaging the cam-shaped end of said hasp when the cam-shaped end of said hasp is inserted in the hasp-receiving opening,

upper and lower bracket means affixed to said backing means and arranged in operable and spaced relationship to said bracket element, and defining a locking pin receiving opening located between said backing means and said upper and lower bracket means and arranged contiguous to and in open communication with the hasp receiving opening,

a locking pin having left side, top and right side edges and being slidably received within the locking pin receiving opening, one of the left and right side edges of said pin having a bevel edge portion that extends downwardly of the top edge of said pin and inwardly toward the other side edge of said pin, the bevel edge portion of said one



edge of said pin being complementary to and for engagement with the bevel edge portion of said hasp, and being diposed to the rear of the shank of said hasp while the complementary bevel edge portions of said hasp and said one edge of said pin are in wedging engagement when said pin is received in the pin-receiving opening of said bracket means,

said complementary bevel edge portions of said hasp and said one edge of said pin in conjunction with the cam-shaped end of said hasp and the opposed portions of said bracket element and said backing means being in cooperative wedging engagement for effecting locking and retaining of said doors in a closed position,

said locking pin including upper and lower portions for abutting said upper and lower bracket means so as to retain said pin within the pin receiving slot during use of said device,

said pin including a shank portion disposed beneath the bevel edge portion of said one edge of said pin,

said shank portion of said pin having a bevel edge portion for initially engaging the bevel edge portion of said hasp when said hasp is connected to said keeper and said pin is in a raised position, and

a seat means mounted on said keeper below said lower bracket means for supporting said shank portion of said pin and said locking pin in a raised position.

3,869,163

HYDRAULIC SHOCK-ABSORBING BUMPERS

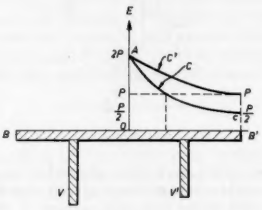
Alain Dera, and Daniel Besseau, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Mar. 23, 1973, Ser. No. 344,209

Claims priority, application France, Mar. 27, 1972, 72.10635

Int. Cl. B60r *19/06*; **B61f** *19/04*; **F16f** *5/00*

U.S. Cl. 293—63 **21 Claims**



1. A power absorbing bumper for automobile vehicles having a longitudinal axis, said bumper comprising:

a bumper bar,

a pair of hydraulic cylinder units pivotally connecting said bumper bar to the vehicle chassis and extending longitudinally between the latter and two intermediate symmetrical points of the bumper relative to said longitudinal axis,

said bumper bar having curved ends extending longitudinally,

resilient means connecting each curved end to said vehicle chassis so as to permit a longitudinal reversible displacement of each end; and

for each cylinder unit, means for resisting the movement of said cylinder unit in response to a transverse displacement of the bumper bar caused by impact forces, said displacement being in a transverse direction from said cylinder unit toward the other cylinder unit.

3,869,164

VEHICLE WITH IMPACT-ABSORBING END PORTION

Kurt Schwenk, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Apr. 18, 1973, Ser. No. 352,323

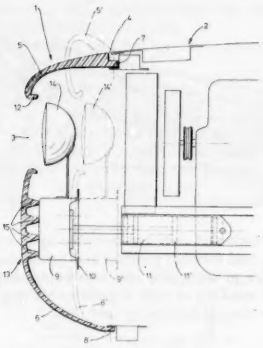
Claims priority, application Germany, Apr. 19, 1972, 2218927

Int. Cl. B60r *19/08*

U.S. Cl. 293—63 **7 Claims**

1. In a vehicle, such as an automobile, having a body and, mounted adjacent at least one end of the body, impact absorbing means including a bumper oriented transversely of the body, the improvement comprising an end portion for the body rigidly connected to the remainder of the body adjacent said one end and extending in a smooth surficial transition from the remainder of the body longitudinally of the vehicle beyond the impact absorbing means so that the impact absorbing means is arranged entirely within said end portion of the body, the end portion being distinct and separate from the

bumper and deformable independently of the impact absorbing means and being constructed so as to yield in such a manner that significant energy dissipation occurs only upon deformation of said impact absorbing means.



3,869,165

VEHICLE WITH REINFORCED IMPACT-ABSORBING END PORTION

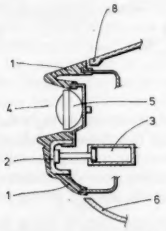
Michael Clendenin Miller, Morse, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Apr. 18, 1973, Ser. No. 352,327

Claims priority, application Germany, June 19, 1972, 2229782

Int. Cl. B60r *19/08*

U.S. Cl. 293—63 **8 Claims**



1. In a vehicle, such as an automobile, comprising an undercarriage; a main body portion; an independent body end portion made of resilient material and having an integrated, transversely extending reinforcement, all of the parts of said end portion being interconnected to form a unit; and impact absorbing means including a transversely extending bumper and at least one shock absorber extending between said bumper and said undercarriage, the improvement wherein said reinforcement of said end portion is constituted by said bumper; wherein said end portion is an extension of said main body portion forming, at the transition, a smooth continuous body surface; and wherein said end portion is deformable in and of itself so that, upon impact, said end portion will deform and subsequently return to its original shape.

3,869,166

FRONT END FOR INCREASING DYNAMIC WHEEL PRESSURE OF PASSENGER MOTOR VEHICLES

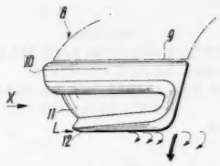
Hermann Burst, Stuttgart, and Rolf Wiener, Gartringen, both of Germany, assignors to Dr. -Ing. h.c.F. Porsche K.G., Stuttgart-Zuffenhausen, Germany

Filed Nov. 14, 1972, Ser. No. 306,384

Claims priority, application Germany, Nov. 15, 1971, 2156588

Int. Cl. B60r *19/04*; **B62d** *37/00*

U.S. Cl. 293—69 R **6 Claims**



1. A front end for a vehicle of the type moving on wheels, said front end comprising:

a front end enclosing means for covering a vehicle front end,

a bumper means for absorbing forces acting on said vehicle front end, and

a means for increasing dynamic wheel pressure of said vehicle,

said means for increasing dynamic wheel pressure being arranged at a portion of said front end enclosing means, and

said portion extending below said bumper means and being formed integrally as a shaped part of said bumper means, wherein said portion of said front end enclosing means, said bumper means and said means for increasing dynamic wheel pressure are connected with each other in one piece,

wherein said means for increasing dynamic wheel pressure is constituted by a bulge-like enlargement of said portion, and

wherein said enlargement is V-shaped in cross section.

3,869,167

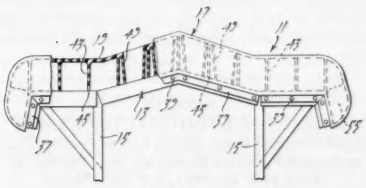
RESILIENT BUMPER ASSEMBLY

George H. Muller, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 1, 1973, Ser. No. 402,521

Int. Cl. B60r *19/08*

U.S. Cl. 293—71 R **6 Claims**



1. A resiliently deformable bumper assembly for a vehicle or the like comprising:

a rigid elongate backing member fixed relative to the vehicle body or the like,

a resiliently deformable elongate outer shell,

means securing said outer shell to the backing member,

said outer shell and said backing member forming an elongate enclosure,

said outer shell including a front wall portion and adjoining top and bottom wall portions,

a plurality of walled elements adjoining and extending rearwardly from said front wall portion toward said backing member, said walled elements circumscribing a void and having an open rearward end,

each said walled element protruding independently from said front wall portion and being spaced from adjacent walled elements,

said walled element being engageable with said backing member upon a frontal impact to said bumper assembly and collapsible to absorb impact energy.

3,869,168

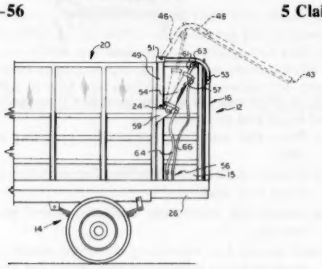
POWER GATE AND LIFT MEANS

Donald L. Matheson, Alton, Kans. 67623

Filed June 4, 1973, Ser. No. 366,781

Int. Cl. A01b *1/00*

U.S. Cl. 296—56 **5 Claims**



1. A power gate and lift means mountable on a truck bed, comprising:

a. a support means secured to said truck bed,

b. gate means pivotally connected to said support means to enclose a rear area of said truck bed and movable from opened to closed positions,

c. power means connected to said support means and said gate means to raise and lower said gate means,

d. said gate means having a tail gate assembly pivotally connected to actuator arms,

e. said actuator arms pivotally connected to said support means and said power means,

f. said tail gate assembly having anchor pin members engagable with said truck bed when in the closed position to prevent lateral movement of said tail gate assembly, and

g. said actuator arms of a J-shape having a long leg extended in a horizontal plane in the closed condition and a short leg extended downwardly from said long leg whereby the connection of said short leg to said tail gate assembly is located between the top and bottom portions of said tail gate assembly, thereby preventing rearward movement of said tail gate assembly in the closed condition.

3,869,169

RETRACTABLE FOOTREST MECHANISM

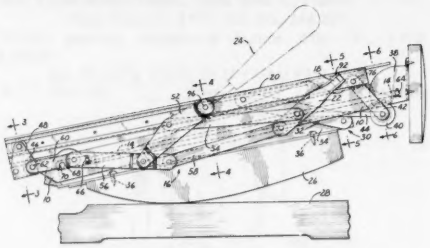
Carl B. Johnson, and Henry James, both of Pontiac, Ill., assignors to Pontiac Furniture Industries, Inc., Pontiac, Ill.

Filed June 28, 1973, Ser. No. 374,486

Int. Cl. A47c *1/02;* **A61g** *15/00*

U.S. Cl. 297—84 **14 Claims**

1. A footrest extension mechanism for a reclining chair comprising a footrest pivoted to the ends of a pair of parallel rails supported on the chair for essentially endwise movement forwardly and rearwardly of the chair for extending and retracting the footrest, drive means connected to said rails to cause said movement, and means connected to said footrest to alter the angularity of the footrest relative to said rails as an incident to said endwise movement between a retracted position with its supporting surface in the front plane of the chair and a forward position facing upwardly to support the occupant's legs, said angularity-altering means being operable as aforesaid by connection with a portion of the chair with respect to which said rails are movable upon extension of the footrest to said forward position and being also thereby movable relative to said rails, said rails being shaped to provide protective masking of said angularity-altering means during movement thereof relative to said rails.



3,869,170

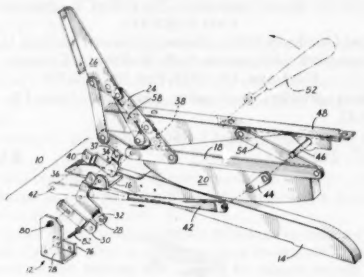
LOCKING MECHANISM FOR RECLINING CHAIRS

Henry James, and Carl B. Johnson, both of Pontiac, Ill., assignors to Pontiac Furniture Industries, Inc., Pontiac, Ill.

Filed June 28, 1973, Ser. No. 374,356

Int. Cl. A47c *3/02;* **A47d** *13/10*

U.S. Cl. 297—270 **12 Claims**



1. In a rocker-recliner chair having a base portion for supporting a chair upon the floor, a rocking portion mounted upon the base portion for rocking movement thereon, and a body-supporting portion movable relative to said rocking portion from a generally upright sitting position to a recline position,

the improvement comprising a locking linkage selectively shiftable between alternate positions to lock the chair against reclining while permitting the same to rock, and conversely, to lock the chair against rocking while permitting the same to recline,

said linkage comprising a first pair of connected links each pivoted respectively to one of said base and said rocking portions on a first axis which is common to both and spaced from the rocking axis when the chair is in neutral balance, and from which the pivots of said first link pair are displaced by said rocking movement, and a second pair of connected links each pivoted respectively to one of said rocking member and said body-supporting portions on a second axis common to both when the chair is in said sitting position and from which the pivots of said second link pair are displaced by said relative movement to the recline position,

the links of said pairs pivoted to the rocking portion being connected together for movement in unison between said alternate positions at one of which said second link pair is aligned in opposition to said relative movement to the recline position, and at the other of which said first link pair is aligned in opposition to said rocking movement, each link pair being aligned to permit relative movement of its associated chair portions when the other pair is aligned in opposition as aforesaid,

and means for shifting said linkage between said alternate positions.

3,869,171

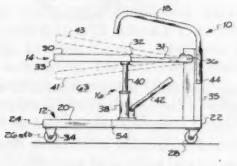
INVALID TRANSPORTER

Riley Wilson, 104 E. Sixth St., Hutchinson, Kans. 67501

Filed Dec. 13, 1973, Ser. No. 424,450

Int. Cl. A47c *3/20*

U.S. Cl. 297—313 **3 Claims**



1. An invalid transporting device of the type in which an invalid is transported in a sitting position, said device comprising:

a. wheeled base means including a substantially triangular shaped horizontally oriented base having a front end and a back end, a pair of laterally spaced wheels being located on a transverse axis and supporting said back end, and a wheel supporting said front end;

b. column support means attached to the front end of the base;

c. straddle and slide board means having a front end and a back end and a pivot arm portion being oriented above said base means in a substantially horizontal position with said board means pivotally attached to the column means for movement in a vertical plane;

d. jack means mounted on said base, spaced from the column means, the upper end of said jack means being attached to the board means approximate its mid-point, said jack means being effective to support said board means above said base means and being adjustable to vary the height of the back end of the board means above said base means.

3,869,172

CHAIR RECLINING MECHANISM

Henry James, and Carl B. Johnson, both of Pontiac, Ill., assignors to Pontiac Furniture Industries, Inc., Pontiac, Ill.

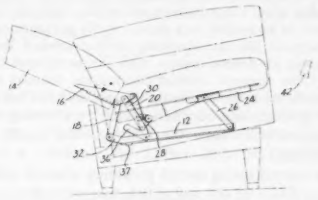
Filed June 28, 1973, Ser. No. 374,355

Int. Cl. A47c *1/02*

U.S. Cl. 297—316 **4 Claims**

1. In a reclining chair having a base, a seat, a back, and linkage means at each side of the chair interconnecting said back and seat and mounting the same upon said base for movement relative thereto and to each other from a sitting position to a reclining position,

the improvement wherein said linkage means supports the back upon the base for forward shifting movement through a fixed path relative to the base as an incident to recline of the back and includes at least one back link extending upwardly from the base to back and pivoted to both for rotation forwardly on the base by the recline of the back, a seat link connecting the forward portion of the seat to the base and being inclined rearwardly and upwardly from the base to the seat when in said sitting position, and a lever pivoted on said back link and connected by a control link to a portion of said chair other



than said seat and with respect to which said back link is relatively movable upon the recline of the back, said lever being also pivoted to the rearward portion of the seat to support the seat and to move the seat forwardly relative to the base of the recline of the back.

3,869,173

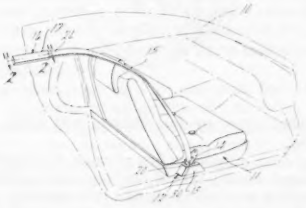
LINEAR RETRACTOR

William P Haller, Milford, and Thomas C. Holka, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1973, Ser. No. 421,380

Int. Cl. A62b *35/00*

U.S. Cl. 297—388 **9 Claims**



1. A linear retractor for a shoulder harness segment of a vehicle seat belt system, having:

an elongated housing of substantially rectangular cross section having opposite side walls and a base wall,

track means on the opposite side walls of the housing,

an arresting device supported on a cross shaft,

anchor means fixing one end of the segment to the housing with the segment extending longitudinally within the housing from the anchor means to a position over and around the arresting device cross shaft and exiting the housing in proximity to its anchored end,

the cross shaft having its ends extending laterally of the arresting device into engagement with the track means to support the arresting device for tilting movement within the housing and for movement longitudinally of the housing from a segment retracted position to a protracted position,

the housing having a plurality of lateral serrations in the base wall extending longitudinally thereof,

the arresting device having detent means at one lateral end edge positioned for engagement with the housing serrations to hold the arresting device against movement longi-

tudinally of the housing in segment protracting direction, wherein the improvement comprises:

cam means on the arresting device adjacent the detent means over which the segment passes,

the cam means in slack condition of the segment deflecting the segment from a straight line relation between its point of departure beneath the cross shaft and its point of departure from the housing,

a sudden protraction movement of the segment causing the latter to be pulled taut and to apply pressure on the cam means to tilt the arresting device toward the base to engage its detent means with the serrations thereby to lock the segment against protraction thereby to restrain a harnessed seat occupant against forward movement,

a first spring means normally urging the arresting device and segment away from the housing base toward retracted position,

and a second spring means providing minimal resistance to protraction of the segment in serration disengaged position of the arresting device.

3,869,174

WHEEL STRUCTURE FOR DIFFERENT BOLT CIRCLE DIAMETERS

Raymond C. Brown, Tarzana, and Ronald D. Bokovoy, Sherman Oaks, both of Calif., assignors to Superior Industries, Inc., Van Nuys, Calif.

Filed Mar. 25, 1974, Ser. No. 454,753
Int. Cl. B60b *3/16*
U.S. Cl. 301—9 DN **3 Claims**

1. A wheel structure for different bolt circle diameters comprising:

a wheel drum including a first plurality of circumferentially arranged, equally spaced lug bolts, said lug bolts having axes lying on a bolt circle of a first diameter;

a wheel having a central web portion which includes a plurality of circumferentially arranged, equally spaced, and radially elongated lug bolt slots, each said slot having opposite, radially extending side walls terminating in semicircular end walls at the opposite extremities of said slot, said slots receiving said lug bolts, respectively, each said slot being elongated sufficiently to receive, instead of said first plurality of lug bolts, a second plurality or a third plurality of lug bolts lying, respectively, on bolt circles of second and third diameters different from said first diameter;

a plurality of washers fitting over said first plurality of lug bolts, respectively, and substantially covering said slots;

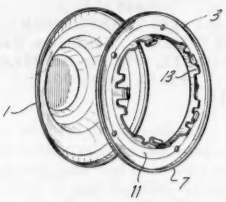
a plurality of flanged, internally threaded lug nuts threadedly connected to said first plurality of lug bolts, respectively, the flanges of said lug nuts bearing upon said washers, respectively, each of said lug nuts having an outer cylindrical bushing section extending through the adjacent one of said washers and into the adjacent one of said slots in close tolerance engagement with said side walls of the slot, said bushing sections being out of engagement with said end walls of the slot whether threadedly connected to said first plurality, said second plurality, or said third plurality of lug bolts whereby said wheel is self-positioning through said engagement between said bushing sections and said side walls and whereby operating loads are transmitted to said wheel through said engagement and through said bearing.

3,869,175

HUB CAP FOR VEHICLE WHEELS

Edward G. Spisak, Westland, Mich., assignor to S & S Product Engineering Service, Inc., Wyandotte, Mich.

Filed Aug. 2, 1973, Ser. No. 386,390
Int. Cl. B60b *7/00*
U.S. Cl. 301—37 R **4 Claims**



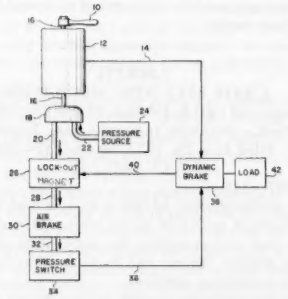
1. A hub cap assembly for attachment to a vehicle wheel having a plurality of circumferentially spaced holes for receiving threaded wheel attaching elements to which attach wheel fastening nuts and a plurality of resilient fingers attached to the wheel between said holes, said assembly including an outer decorative cap and an inner ring member attached to the cap, the ring member having an annular axially extending flange, a plurality of circumferentially spaced resilient fingers extending from the annular flange and adapted to engage the fingers on the wheel, a plurality of cut-away sections on said flange between said fingers and adapted to fit over wheel fastening nuts threaded on said threaded wheel attaching elements, the sections each defining stops positioned at approximately the same radial outward distance from the axis of the wheel as the nuts so that the nuts cooperate with the edges to prevent relative rotation between the wheel and the hub cap assembly.

3,869,176

APPARATUS FOR PREVENTING RAILWAY WHEEL LOCK

John Kessler, 38-14 Broadway, Long Island City, and Joseph Franco, 496 Park Ave., Uniondale, L. I., both of N.Y. 11106

Filed Apr. 13, 1973, Ser. No. 350,845
Int. Cl. B60t *17/18*
U.S. Cl. 303—3 **2 Claims**



1. In a vehicle braking system of the type having a controller regulating the degree of brake application, an air valve, a pressure source whose application is goverened by the air valve, and including a dynamic brake having a load electri-

cally connected across the dynamic braking motors, a lock-out magnet determing the application of the fluid pressure to an air brake in response to the dynamic brake, the air brake being connected through a pressure line to the output of the lock-out magnet, wherein the improvement comprises:

a pressure switch connected to the pressure line at the output of the lock-out magnet for sensing the pressure in the air brake said switch being set at a predetermined pressure level;

a solenoid located between the load and the dynamic brake for electrically disconnecting the load; and

a conductor connected between said pressure switch and said coupling means so that when the lock-out magnet fails to regulate the application of the fluid pressure brakes and the dynamic braking motors, at the predetermined pressure level said switch sends an electrical signal through said conductor causing said solenoid to disconnect the load from the dynamic braking motors.

3,869,177

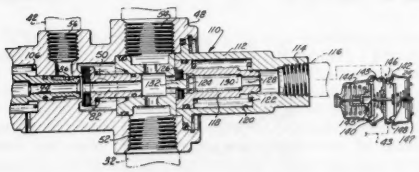
PNEUMATIC ANTI-SKID CONTROL BRAKE SYSTEM WITH AN EMERGENCY BRAKE CONTROL VALVE

John A. Urban, Livonia; Gary L. Hopkins, Southfield, and John Keith Armstrong, Livonia, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 192,438, Oct. 26, 1971, abandoned. This application Feb. 12, 1973, Ser. No. 354,631

Int. Cl. B60t *8/06, 15/02, 13/28*

U.S. Cl. 303—21 F **4 Claims**



1. A brake control system for controlling the application of fluid operated brakes of a wheeled vehicle, said system comprising:

A. a fluid operated brake actuator for applying the brakes of a wheel;

B. a relay valve for controlling the application of fluid pressure to said brake actuator, said relay valve including

1. a service port in communication with said brake actuator,

2. a supply port,

3. a pilot portion for communicating said supply port with said service port in response to a fluid pressure, and

4. operator means for venting said pilot portion;

C. a first source of fluid pressure;

D. a second operator controlled source of fluid pressure;

E. reservoir means connected with said first source and said supply port;

F. control valve means connected to said reservoir means, said first source, said operator controlled source, and said pilot portion, said control valve means including

1. means for selectively communicating said pilot portion with said operator controlled source of fluid pressure when the pressure from said first source is above a predetermined level, whereby normal braking of said wheel is provided by communicating said supply port with said service port in response to a fluid pressure from said operator controlled source of fluid pressure, and

2. means for selectively communicating said pilot portion with said reservoir means when the pressure from said first source is below a predetermined level, whereby said emergency braking of said wheel is provided by communicating said supply port with said service port in response to the fluid pressure from said first source falling below said predetermined level;

G. skid control means for detecting a skid at the braked wheel and generating a skid signal; and

H. circuit means connecting said operator meand and skid means for actuating said operator means to vent said pilot portion when a skid signal is generated, thereby providing skid control of said braked wheel during normal and emergency braking.

3,869,178

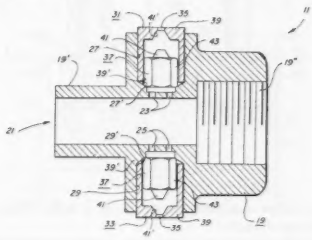
DEVICE FOR PREVENTING PRESSURE OR VACUUM BUILD-UP IN PNEUMATIC BRAKE SYSTEMS

Leon E. Day, 3027 Juca Ln., Memphis, Tenn. 38116, and Amond B. Millican, Rt. 2, Box 200, Decaturville, Tenn. 38329

Filed Nov. 19, 1973, Ser. No. 417,219

Int. Cl. B60t *11/34*

U.S. Cl. 303—67 **3 Claims**



1. The combination with a pneumatic brake system having a pneumatic pump, a brake valve, and a pneumatic line leading from the pneumatic pump to the brake valve, of a device for preventing pressure or vacuum build-up in the pneumatic brake system when the pneumatic pump is deactivated, said device comprising:

a. body means mounted in the pneumatic line intermediate the pneumatic pump and the brake valve, said body means including air passage means for allowing air to flow between the pneumatic pump and the brake valve through the pneumatic line, first and second valve chamber means substantially **180°** opposed to each other, and first and second air bypass means between said air passage means and said first and second valve chamber means respectively for allowing ingress and egress of air between said air passage means and said first and second valve chamber means;

b. first valve means mounted in said first valve chamber means of said body means for relieving pressure or vacuum build-up in said air passage means of said body means when the pneumatic pump is deactivated, said first valve means including housing means complementary shaped with said first valve chamber means, said housing means including air vent means for allowing ingress and egress of air between said first valve chamber means and the atmosphere, said first valve means including slide means for controlling the ingress and egress of air between said first valve chamber means and the atmosphere through said air vent means by controlling the size of said air vent means; and

c. second valve means mounted in said second valve chamber means of said body means for relieving pressure or vacuum build-up in said air passage means of said body means when the pneumatic pump is deactivated, said second valve means including housing means complementary shaped with said second valve chamber means, said housing means including air vent means for allowing ingress and egress of air between said second valve cham-

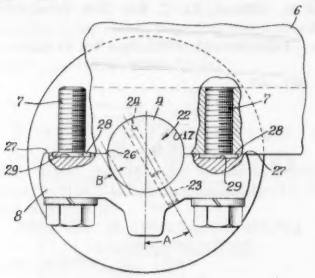
ber means and the atmosphere, said first valve means including slide means for controlling the ingress and egress of air between said second valve chamber means and the atmosphere through said air vent means by controlling the size of said air vent means.

3,869,179

BRACKET AND BOLT-RETAINING MEANS FOR TRACTOR ROLLER ASSEMBLIES

John S. Ricca, Bartonville, and Robert N. Stedman, Chillicothe, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Sept. 17, 1973, Ser. No. 397,585
Int. Cl. F16c *25/00*
U.S. Cl. 308—34 **8 Claims**



1. In a roller assembly comprising a roller hub rotatably supported on a shaft,

a. mounting means for mounting said assembly on a roller frame, said mounting means including,

b. a mounting bracket including a pair of bolts on opposite sides of a central, journal portion receiving said shaft, said bolts being in spaced, substantially parallel relation and defining a bolt axis, said mounting bracket being retained within said assembly bracket-retaining means including,

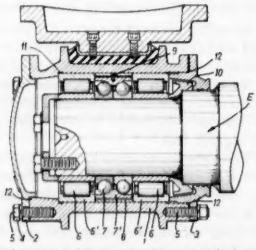
c. a lock pin, said lock pin being fitted within a bore extending from said mounting bracket and into said shaft and which is at an oblique angle to said bolt axis so that any tendency of said mounting bracket to move away from said shaft would be directed in the oblique angle direction by said pin.

3,869,180

RAILWAY JOURNAL BOX BEARING RACE MOUNTING

Claude Sonnerat, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy, France

Filed Sept. 12, 1972, Ser. No. 288,261
Claims priority, application France, Sept. 30, 1971, 71.35299
Int. Cl. B61c *15/12, 15/20;* **F16c** *13/02*
U.S. Cl. 308—180 **4 Claims**



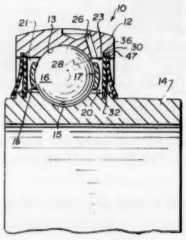
1. Apparatus for rotatably mounting an axle body in an axle box, comprising: a first set of outer roller bearing races fixed to said axle box; a first set of inner roller bearing races fixed to said axle body; a first set of cylindrical rollers disposed between said first sets of inner and outer bearing races for bearing substantially only radial loads developed between said axle body and axle box; a second set of outer roller bearing races fixed to said axle box and spaced from said first set of outer bearing races; a second set of inner roller bearing races fixed to said axle body and spaced from said first set of inner bearing races; a second set of cylindrical rollers disposed between said second sets of inner and outer bearing races for bearing substantially only said radial loads; a distance member axially clamped between said first and second sets of outer bearing races; at least one set of outer and inner ball bearing races disposed concentrically with respect to said distance member and between said first and second sets of roller bearing races; and at least one set of ball bearings located in angular or oblique contact between said outer and inner ball bearing races for bearing substantially only axial loads developed between said axle body and axle box, said distance member being ring-shaped and having an axial width greater than the axial width of said at least one outer ball bearing race.

3,869,181

RESILIENT MULTIPLE ELEMENT BEARING SEAL

Richard H. Barber, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Continuation-in-part of Ser. No. 194,641, Nov. 1, 1974, Pat. No. 3,748,003. This application Apr. 16, 1973, Ser. No. 351,432
Int. Cl. F16c *33/78, 33/80;* **F16j** *15/34*
U.S. Cl. 308—187.2 **3 Claims**



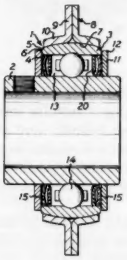
1. A bearing seal for sealing a bearing assembly including outer and inner annular members which are rotatable relative to one another and which are spaced apart for receiving antifriction elements and lubricant therebetween, said annular members having oppositely disposed grooves in each axial end thereof and at least one of said annular members having corner portions axially outwardly of the grooves, and a pair of annular sealing structures, one for each axial end of said members, each of said sealing structures including in combination,

a first annular sealing ring comprising a radial body portion with an outer peripheral sealing portion extending radially outwardly therefrom and being positioned in the assembly to fit into a groove in said outer member and with an inner annular sealing portion extending radially inwardly therefrom and being positioned in the assembly to fit into a groove in said inner member, said first annular sealing ring further including a portion molded integral to said body portion and extending axially outwardly in an interference fit to provide a reservoir therebetween with the specified one annular member, and

a second annular sealing ring comprising a radial body portion with an outer peripheral sealing portion extending radially outwardly therefrom and with an inner annular sealing portion extending radially inwardly therefrom, said second annular sealing ring being positioned in the assembly with one of said outer peripheral or inner annular sealing portions being positioned adjacent one of said

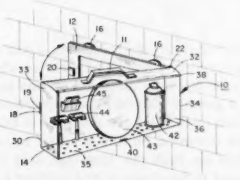
outer peripheral and inner annular sealing portions of said first annular sealing ring positioned in the groove in the annular member opposite the specified one annular member, and the other of said outer peripheral and inner annular sealing portions extending axially outwardly from the assembly with said radial body portion extending across the space between the annular members to engage the corner portion of the specified one annular member in a running contact seal.

3,869,182
BALL BEARING
Nils Bertil Glifberg, Staffanstorp, Sweden, assigaor to Svenska Sockerfabriks Aktiebolaget, Malmo, Sweden
Filed July 6, 1973, Ser. No. 376,987
Int. Cl. F16c *1/24*
U.S. Cl. 308—187.2 **4 Claims**



1. In a ball bearing assembly of the type including an inner bearing ring and an outer bearing ring supporting a plurality of balls therebetween, said inner bearing ring being in the form of a sleeve which projects axially outwardly of a side face of the outer bearing ring, said face being defined by inner and outer perhipheral edges, the space for the balls between the inner and outer bearing rings being protected by sealing means mounted in said space inwardly of said side face of the outer ring against entrance of water and dirt, the improvement wherein said bearing comprises a first rigid substantially plane washer of considerable thickness secured to the outwardly projecting end portion of said inner sleeve-shaped bearing ring, the outer periphery of said washer extending radially past said inner edge of said outer bearing ring, said washer overlying and adjoining at least a portion of the side face of said outer bearing ring, and a second protection means located inwardly of and adjacent said first washer within the space between said bearing rings.

3,869,183
SHOWER BATH CADDY
Mack Frank, Jr., P.O. Box 73, Oberlin, La. 70655
Filed Sept. 27, 1973, Ser. No. 401,295
Int. Cl. A47b *67/02*
U.S. Cl. 312—248 **1 Claim**

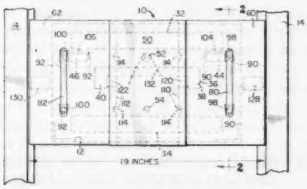


1. For use in connection with a shower bath, a caddy comprising a support bracket having suction cups thereon for removably securing the bracket to the wall of the shower bath; and

a cabinet hingedly mounted on said bracket designed to hold miscellaneous toilet articles for shaving, said cabinet being rotatable toward and away from the user depending on the user's position within the shower bath, thereby allowing the user to comfortably shave after taking a shower or bath, said cabinet includes a base, four laterally extending side walls, a mirror within said cabinet and a transparent door hingedly secured to one of said side walls, to allow the user thereof to see into said mirror through said transparent door, and

at least one of said side walls having perforations therein to ventilate said cabinet.

3,869,184
TWO-WAY TRAVEL FRONT PANEL
Ronald D. Lambert, and Jack R. Bradford, both of Indianapolis, Ind., assignors to Herbert S. Fall, Indianapolis, Ind.
Filed July 18, 1973, Ser. No. 380,339
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 **20 Claims**

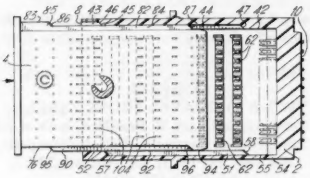


1. A cabinet structure comprising a cabinet frame having forward and rearward sides, a drawer having opposite sides and forward and rearward ends, said drawer having a width and height, a slide extending along each side of said drawer and supporting it in said frame for rectilinear movement forwardly and rearwardly from its normal position relative to said frame, and panel means mounted on one end of said drawer, said panel means providing a cover for said one end, said panel means including a pair of side panels and means for mounting said side panels for lateral movement on said drawer between respective outer positions and inner positions, said panel means having a width substantially equal to the width of said drawer when said side panels are in their respective outer positions, said panel means having a height substantially equal to the height of said drawer, said side panels being engageable with said frame in said outer positions to prevent movement of said drawer on said slides in at least one direction relative to said frame, said side panels having a height substantially equal to said drawer height, and said side panels being disposed laterally inwardly from said slides in said inner positions to permit movement of said drawer forwardly and rearwardly on said slides.

3,869,185
ELECTRICAL CONNECTOR ASSEMBLY
Wladimiro Teagno, Turin, Italy, assignor to AMP Incorporated, Eisenhower Blvd., Pa.
Filed Mar. 18, 1974, Ser. No. 452,093
Claims priority, application Italy, Mar. 29, 1973, 22340/73
Int. Cl. H01r *13/62*
U.S. Cl. 339—65 **5 Claims**

1. An electrical connector assembly comprising a first hollow insulating housing having an aperture which provides access to the hollow interior for a second insulating housing carrying a plurality of aligned rows of spaced electrical contacts which engage aligned rows of spaced electrical contacts in the hollow interior, the rows of contacts extending at right angles to the axial direction of movement of the second housing within the interior of the first housing on engagement and disengagement of the housings, surface means on

the first and second housings cooperating so that on initial axial movement of the second housing within the interior of the first housing on assembly of the housings, the contacts of the second housing are guided between the contacts of the first housing, a cam surface means on the second housing cooperating with a cam surface means on the first housing so



that when the second housing reaches a predetermined position within the interior of the first housing, the second housing moves laterally relative to the first housing to align the contacts of the housings and further surface means on the first and second housings cooperating so that on further axial movement of the second housing within the interior of the first housing, the contacts engage.

3,869,186

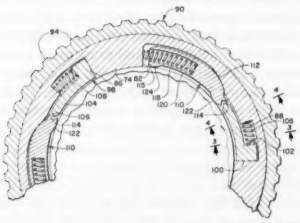
ELECTRICAL CONNECTOR WITH AUTOMATIC THREAD LOCKING MECHANISM

Ottomar H. Vetter, Minneapolis, Minn., assignor to TRW, Inc., Minneapolis, Minn.

Filed Oct. 9, 1973, Ser. No. 404,648

Int. Cl. H01r *13/54*

U.S. Cl. 339—89 R **12 Claims**



1. A connector comprising first and second components adapted to be mated together along a longitudinal axis, helical coupling means for causing mating and unmating of said components, drive means rotatable about said axis having means movable therewith for abutting against a portion of said coupling means to rotate said coupling means in one rotative direction to effect said mating when said drive means is rotated in said one rotative direction, and wedge means shiftable in a circular path about said axis relative to both said coupling means and said drive means, said coupling means having means thereon for shifting said wedge means in its said circular path in said one rotative direction when said coupling means is rotated in its said one rotative direction by said drive means and said wedge means resisting helical retraction of said coupling means in a reverse rotative direction opposite to said one rotative direction and hence unmating of said components, said abutting means on said drive means abutting said wedge means to render said wedge means ineffectual when said drive means is rotated in a reverse direction opposite to said one rotative direction.

3,869,187

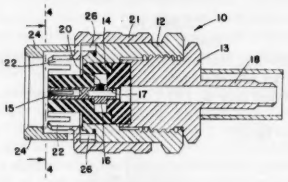
QUICK CONNECT/DISCONNECT COAX CONNECTOR

Chalice Bingham, Oak Ridge, Tenn., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Mar. 12, 1974, Ser. No. 450,417

Int. Cl. H01r *13/54*

U.S. Cl. 339—91 P **10 Claims**



1. An electrical connector for a coaxial line comprising:

a. a female portion having a hollow axial connecting terminal surrounded by a tubular insulator, and including an outer conductive cylinder and an inner locking plug for holding the tubular insulator in place;

b. a locking sleeve slidably positioned on the outer conductive cylinder integrally connected to a plurality of locking fingers;

c. an annular shield secured to the outer cylinder formed with slots for the passage of a flange which supports the locking fingers; and

d. a male portion having an axial conductive extension for entering the connecting terminal and supported by a tubular cylinder formed with an annular groove for engagement by the ends of said locking fingers when the male and female portions are joined.

3,869,188

METER MOUNTING BOX

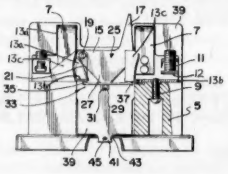
Ian Y. Morrison, Missisnauga, Ontario; Loudon C. Spark, Newmarket, Ontario, and Jelle J. Duyf, Toronto, Ontario, all of Canada, assignors to Murray-Jensen Manufacturing Ltd., Toronto, Ontario, Canada

Filed Mar. 26, 1973, Ser. No. 344,530

Claims priority, application Canada, Mar. 29, 1972, 138462

Int. Cl. H01r *13/38*

U.S. Cl. 339—95 R **3 Claims**

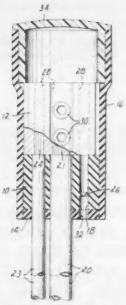


1. In a meter mounting device having a pair of jaw terminals for accepting terminal tongues of a meter when the meter is mounted; a lever pivotally mounted on one jaw terminal, said lever having a portion extending into position to be engaged by a meter when its tongues are accepted in said jaw terminals; a bridging bar mounted on and secured to said lever; and a contact surface on each jaw terminal, said contact surfaces being positioned to be engaged and bridged by said bar when said meter is absent, and said bridging bar being positioned to slidingly engage and disengage said contact surfaces as said meter is mounted and removed, thereby cleaning the contact surfaces; and a spring mounted at the pivoted end of said lever and presses against one of said jaw terminals and against said lever to bias said lever and bar into bridging position.

3,869,189
UNDERGROUND ELECTRICAL CONNECTOR

Bob C. McCurdy, P.O. Box 33427, White Bear, Minn. 55133

Filed Oct. 3, 1973, Ser. No. 403,161
U.S. Cl. 339—96 3 Claims



1. A multiple electrical conductor connector assembly comprising:

a resilient cylindrical adapter seal formed with a plurality of apertures extending therethrough parallel to its axis, each said aperture having a normal diameter less than that of a specified cable and being expandable to receive the same,

an electrically conductive metal terminal block connecting the conductors at the ends of a distribution cable extending through said apertures in said adapter seal and the conductors at the ends of feeder cables pushed through said apertures in said adapter seal to be tapped into said distribution cable,

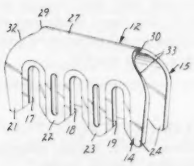
a rigid stress relief ring lying adjacent said adapter seal and receiving the cables prior to their passing through said adapter seal, and

a cover having a closed end extending over said terminal block and forming with said adapter seal a watertight seal around said terminal block.

3,869,190
SOLDERLESS WIRE CONNECTOR

James H. Bazille, Jr., North Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 29, 1974, Ser. No. 456,135
Int. Cl. H01r 11/20
U.S. Cl. 339—98 6 Claims

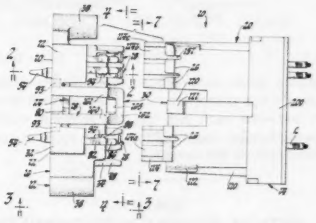


1. A spring compression reserve wire-connector contact, comprising a pair of spaced planar interconnected resilient contact elements having multiple wire-receiving slots defined by parallel extended legs, each slot in one element being aligned with a slot in the other element, and the portion interconnecting the contact elements being relieved at both ends, each relief extending inward from the end to alignment with the outer edge of the first wire receiving slot.

3,869,191
CONNECTOR MEANS HAVING SHORTING CLIP

Emil J. Tolnar, Jr., Warren, and Arthur H. Winyard, Cortland, both of Ohio, assignors to General Motor Corporation, Detroit, Mich.

Filed Oct. 11, 1973, Ser. No. 405,450
Int. Cl. H01r 13/12
U.S. Cl. 339—111 3 Claims



1. An electrical connector means comprising: a first insulator housing having a plurality of first spaced apart cavities therein, a first plurality of metal terminals housed in said first cavities and having exposed forward end portions, a second cavity in said first insulator housing, a spring clip housed within said second cavity, said spring clip having a bridge portion extending transversely of the cavity and a plurality of spaced resilient fingers extending transversely of the bridge portion and overlying the respective ones of the first terminals, said fingers each having a depending portion which is engaged with one of the first plurality of terminals to provide a shorting path between the first plurality of terminals, said spring clip when disposed in the second cavity being self-biased toward a position in which their depending portions engage the respective first plurality of terminals, a second insulator housing which is matable with the first insulator housing, said second insulator housing having a plurality of spaced cavities therein, a second plurality of metal terminals housed in said cavities of said second insulator housing which are adapted to mate with the first plurality of terminals in the first insulator housing, said second insulator housing having a cam means intermediate its ends, said insulator housings when being connected together first causing said first and second plurality of terminals to matingly engage each other and then causing said cam means on said second insulator housing to engage the spring fingers of the spring clip to move the spring fingers in opposition to their self-biasing forces to disengage the spring clip from the first plurality of terminals.

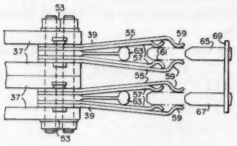
3,869,192
CIRCUIT BREAKER WITH PRE-LOADED TERMINAL CONNECTORS

Alfred E. Maier, Beaver Falls, and James O. Rexroad, Beaver, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 29, 1973, Ser. No. 364,453
Int. Cl. H01r 3/00
U.S. Cl. 339—147 6 Claims

1. A circuit breaker for use in drawout switchgear having spaced line stabs and including a circuit breaker and a stationary housing having stationary terminals, the stationary terminals being movable into and out of contact with the line stabs, the circuit breaker comprising a pair of separable contacts, means for moving the contacts between open and closed positions, first conductor means for connecting one of the contacts to one of the stationary terminals, second conductor means for connecting the other contact to the other terminal,

each stationary terminal comprising a quick detachable terminal connector, each connector including a pair of oppositely disposed flexible terminal contacts engageable with opposite sides of a line stab, said oppositely disposed terminal contacts



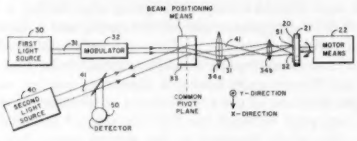
being spaced from each other by a distance less than the thickness of a line stab when out of contact with said stab, and a spacer between each pair of said terminal contacts, said spacer being flexibly mounted to yield in response to pressure from either side of the spacer.

3,869,193

OPTICAL MEMORY WITH IMPROVED SIGNAL-TO-NOISE RATIO

Francis M. Schmit, Saint Louis, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Sept. 18, 1973, Ser. No. 398,364
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 **8 Claims**



1. An optical memory comprising:

a memory medium;

first light source means for producing a write beam;

second light source means for producing a read beam angularly separated from the write beam in a first direction;

focusing means for receiving the write beam and the read beam and for focusing the write and read beams to first and second focused light spots respectively at the memory medium, the first and second focused light spots spatially separated from one another in the first direction, the read beam having a larger beam diameter than the write beam at the focusing means whereby the second focused light spot has a diameter which is less than the diameter of the first focused light spot at the memory medium.

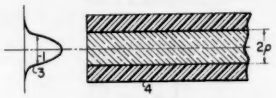
3,869,194

FIBER FOR OPTICAL COMMUNICATION

Satoshi Shiraishi; Kunio Fujiwara; Yasuhiko Kumagai, and Shiro Kurosaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed July 3, 1973, Ser. No. 376,270
Claims priority, application Japan, July 3, 1972, 47-66554
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **1 Claim**

1. A method of exciting an optical fiber of the type consisting of a core of high purity fused quartz glass clad with an organic material having a lower refractive index than that of said core and selected from the group consisting of polytetrafluoroethylene, tetrafluoroethylenehexafluoropropylene copolymer, polychlorotrifluoroethylene, polyvinylidene fluoride, polytrifluoroisopropylmethacrylate, fluorovinylidenehexafluropropylene copolymer, and polyvinyl fluoride, comprising projecting a Gaussian light beam of 0.3 to 0.6 of *T*/2



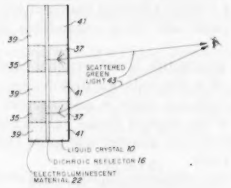
ρ, wherein T represents the half amplitude width of the light beam and ρ represents the radius of the core, over the cross section of the optical fiber.

3,869,195

LIQUID CRYSTAL DISPLAY CONTAINING SEGMENTED SOURCE OF BACK-LIGHTING

Ralph E. Aldrich, Acton; Julius Feinleib, Cambridge, and Lawrence E. Schmutz, Arlington, all of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed July 2, 1973, Ser. No. 375,980
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 LC **12 Claims**



1. A display which is illuminated by an external source of front lighting, comprising:

a. a layer of liquid crystal material which exhibits dynamic scattering upon application of an electric field thereacross, said layer being positioned between a front transparent electrode and a back transparent electrode;

b. means to selectively apply an electric field across discrete areas of said layer of liquid crystal material;

c. a source of back-lighting;

d. means to selectively activate predetermined areas of said source of back-lighting, said predetermined areas coinciding with discrete areas of said liquid crystal materials which are activatable; and,

e. a dichroic reflecting layer positioned between said liquid crystal material and said source of back-lighting, said dichroic reflecting layer being one which transmits wave lengths emitted by said source of back-lighting and which reflects other wave lengths.

3,869,196

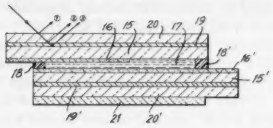
LIQUID CRYSTAL DISPLAY DEVICE

Kanemitsu Kubota, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 432,117
Claims priority, application Japan, Jan. 11, 1973, 48-6090
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 LC **2 Claims**

1. In a liquid crystal display device wherein liquid crystals in a cell formed of opposed glass plates rotate the plane of polarization of linearly polarized light through 90° in the absence of an electric field across said cell and which are non-rotatory in the presence of a sufficiently strong electric

field, said cell having suitably disposed transparent conductive elements on the inner surfaces of said glass plates covering only part of said surfaces, said cell further having polarizer and analyzer members disposed with axes at right angles to



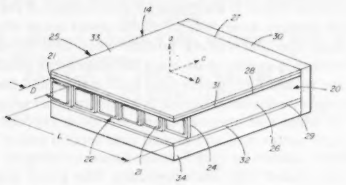
each other exterior to either plate of said cell, the improvement wherein each of said polarizer and analyzer members comprises a polarizing film held firmly between inner and outer sheets of glass and said cell comprises the inner sheet of each of said polarizer and analyzer members.

3,869,197

LIGHT-DEFLECTING SYSTEM FOR EFFECTING BRAGG DIFFRACTION OVER A WIDE BANDWIDTH

James C. Owens, and Richard N. Blazey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 30, 1973, Ser. No. 383,850
Int. Cl. G02f *1/32*
U.S. Cl. 350—161 **4 Claims**



1. An acoustooptic light deflecting system having an efficiency greater than a minimum predetermined efficiency and operable with respect to the center frequency of a predetermined bandwidth, comprising:

means for generating a beam of monochromatic light that is relatively narrow in width as compared to length and for directing the beam along a prescribed path;

oscillator means for generating an electrical signal of a preselected frequency that is generally within the bandwidth;

an acoustooptic medium responsive to a constant acoustical power and having center frequency that is offset with respect to the bandwidth center frequency, spaced, parallel incident and exit side surfaces and spaced, parallel ends, the medium being positioned in the prescribed path with the light beam intersecting the incident side surface at an angle to effect Bragg diffraction of the light beam and being displaced relative to the prescribed path in a direction to optimize the efficiency and resolution of the system;

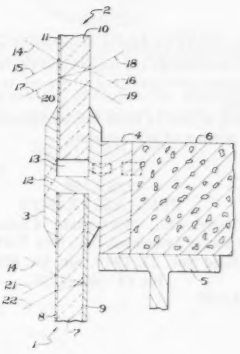
transducer means comprising a number of piezoelectric elements, each of generally rectilinear shape, bonded to one end in spaced-apart relation and extending generally in the direction of the path, and phasing means associated with each of the elements for radiating the latter in phase, the elements providing an array, having a resonance frequency that is offset relative to the bandwidth center frequency and being responsive to the selected frequency for generating a number of series of acoustic waves in the medium in accordance with the number of elements; and matching circuitry having an offset center frequency for electrically balancing and interconnecting the oscillator means and piezoelectric elements, whereby the incident beam is diffracted at a different angle by each series of waves to produce a diffracted light beam uniquely associated with the selected frequency, and whereby the offset of the center frequency of the medium, the array and the matching circuitry increases the efficiency over and above that greater than the minimum predetermined efficiency.

3,869,198

HEAT AND LIGHT REFLECTING SPANDREL

John D. Ballentine, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 22, 1972, Ser. No. 291,430
Int. Cl. G02b *17/00*
U.S. Cl. 350—259 **14 Claims**



1. An article for reflecting visible light comprising:

a transparent substrate having a first major surface and a second major surface opposite to the first major surface; a transparent, reflective coating disposed over substantially all of the first major surface of said substrate to provide said substrate with (1) a transmitted dominant wavelength for visible light, which transmitted dominant wavelength is determined by transmittance to visible light of said substrate and said transparent, reflective coating, and (2) a reflectance to visible light which is determined by said transparent, reflective coating; and

an opaque, reflective coating disposed over substantially all of the second major surface of said substrate, said opaque, reflective coating having a reflective dominant wavelength for visible light substantially equivalent to the transmitted dominant wavelength to provide the article with a total reflectance to visible light that exceeds the visible light reflected from said transparent, reflective coating and a dominant wavelength substantially equivalent to the dominant wavelength of light transmitted through said transparent reflective coating.

3,869,199

SOLAR ENERGY ABSORBER

Richard D. Cummings, Reading, Mass., assignor to Itek Corporation, Lexington, Mass.

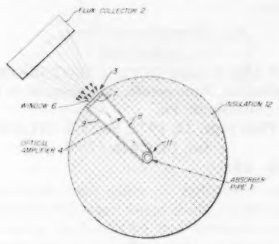
Filed Dec. 13, 1973, Ser. No. 424,589
Int. Cl. G02b *5/10*
U.S. Cl. 350—293 **12 Claims**

1. A solar energy absorber comprising:

a. a conduit for containing a fluid to be heated by the sun's rays;

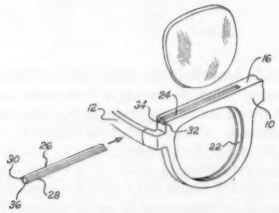
b. at least one elongated optical amplifier for concentrating solar energy directed therethrough having a first terminal

portion for receiving solar energy and having a second terminal portion for directing solar energy at said conduit, said optical amplifier comprising a pair of reflective wall elements which converge in a direction from said first terminal portion toward said second terminal portion, the width of said first terminal portion being no greater than about 1½ inches and the width of said second terminal portion being no greater than about ½ of an inch; and



c. insulating means of solid insulating material covering at least a portion of said conduit.

3,869,200
EYEGLASS FRAMES
David S. Danylewich, Burlington, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y.
Filed Nov. 23, 1973, Ser. No. 418,413
Int. Cl. G02c *1/08*
U.S. Cl. 351—85 **5 Claims**

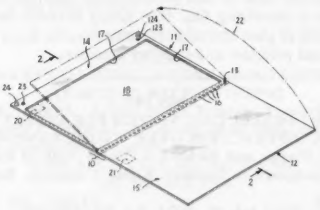


1. An eyeglass frame for a pair of lenses comprising a main frame having a pair of slots vertically extending to receive a pair of lenses respectively and a pair of horizontal slots of selected length extending across said vertical slots respectively, a pair of retaining bars frictionally and slidably disposed in said horizontal slots respectively and extending across said entire lengths respectively for directly engaging and for retaining said lenses, and a pair of earpieces mounted on said frame.

3,869,201
PHOTOPLASTIC FILM MICROFICHE INCLUDING A PROTECTIVE COVER
Gordon Lysle, Greenlawn, N.Y., assignor to Gordon Lysle, Incorporated, East Northport, N.Y.
Filed Oct. 12, 1973, Ser. No. 405,913
Int. Cl. G03b *21/11, 23/08*
U.S. Cl. 353—120 **11 Claims**

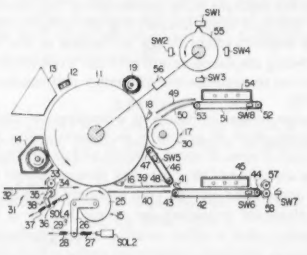
1. A photoplastic film microfiche assembly comprising

1. a rectangular photoconductive film sheet having a specular thermoplastic surface which includes a portion provided with a certain rectilinear pattern arrangement of a plurality of separate message image bearable panel areas that are selectively message image deformable; and
2. a flat rectangular base card structure of relatively rigid sheet material having a limited degree of flexibility and a top surface; characterized by
3. said base card structure being subdivided into a pair of lappable sections which are transversely hinged together in a manner to permit this card structure selectively to be hingedly folded to lap and sections together with their top surfaces opposed between the lapped sections and opened to substantial mutual alignment for defining together a relatively flat card structure;
4. a first one of said lappable card sections being provided with a rectangular window area and means anchoring thereto said photoconductive film sheet having its specular surface portion aligned with said window area and facing in the same direction as the top surface of this section to be covered by the other of said sections upon lapping the latter to said windowed section;



5. means to provide the top surface of the other second one of said card sections with the appearance of a guide grid pattern which is a substantial area replica of the rectilinear pattern arrangement of the panel areas of said film sheet specular surface portion when said second cover section is swung to its open flat alignment position relative to said first filmcarrying card section and the latter is inserted adjustably for use in a camera processing apparatus while said opened second section is exposed to view, these patterns of said second card section and of said film sheet carried by said first card section being so structurally related that each particular film panel area of the inserted film sheet will be accurately aligned with the axis of an optical path of such apparatus when a guide part of the grid area replica of this film panel area is moved to alignment of an observable fixed reference point of such apparatus.

3,869,202
ELECTROPHOTOGRAPHIC COPYING MACHINE
Yasuhiro Tabata, Yokohama, and Takeshi Ukai, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan
Filed Dec. 7, 1973, Ser. No. 422,788
Claims priority, application Japan, Dec. 29, 1972, 47-3737
Int. Cl. G03g *15/00;* **B65h** *5/22*
U.S. Cl. 355—3 R **3 Claims**



1. An electrophotographic copying machine including a rotatable body of photosensitive material; an original receptacle for placing an original thereon; and a charger, an exposure

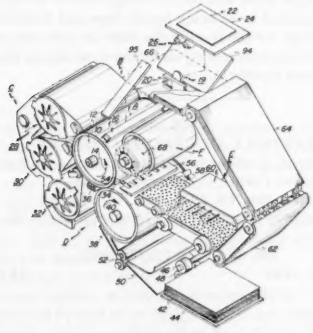
unit, a developing unit and a transfer unit arranged in sequence around the periphery of the rotatably body along the direction in which the body is rotated, said charger being effective to charge the body when it is desired to obtain a copy, said exposure unit being effective to provide an exposure of an original placed on a predetermined surface of the original receptacle and projecting an image thereof onto the body to form an electrostatic latent image thereon, the developing unit being effective to develop the latent image with a toner, the transfer unit effecting a transfer of the developed toner image on the body onto one surface of a transfer sheet supplied thereto; and a fixing unit for fixing the transferred image on the transfer sheet; characterized in that the original receptacle has a first and second surface for placing a pair of originals thereon and is movable so as to selectively bring the first or second surface into a predetermined position, and that a second transfer unit is arranged around the periphery of the body at a position beyond the developing unit as viewed in the direction of rotation of the body, the machine being adapted to effect a two cycle copying operation wherein in the first cycle, an original placed on the first surface is copied on a first surface of a transfer sheet, which sheet is conveyed to and retained in said fixing unit until during the second cycle, a developed image of an original placed on the second surface of the original receptacle is formed on the body, whereupon the transfer sheet retained in the fixing unit is supplied to the second transfer unit for bringing its second surface into operative association with the developed image on the body.

3,869,203

COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE

Ernest H. Lehmann, Arcadia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 18, 1973, Ser. No. 398,342
Int. Cl. G03g *15/00*
U.S. Cl. 355—4 **18 Claims**



1. An electrophotographic printing machine, including:

a photoconductive member;

means for charging said photoconductive member to a substantially uniform level;

means for exposing said charged photoconductive member to a light image recording an electrostatic latent image thereon, said exposing means being adapted to form color filtered light images and a non-color filtered light image;

means for developing the electrostatic latent image recorded on said photoconductive member with toner particles, said developing means being arranged to develop the electrostatic latent image corresponding to the non-color filtered light image with black toner particles and the electrostatic latent image corresponding to the color filtered light images with toner particles complementary in color thereto, said developing means comprising first means for depositing black toner particles onto the non-color filtered electrostatic latent image recorded on said photoconductive members, first means for actuating said toner particle depositing means in response to the non-color filtered electrostatic latent image advancing to a predetermined location, whereby said first toner particle depositing means moves from an inoperative position spaced from the non-color filtered electrostatic latent image to a position adjacent thereto and in operative communication therewith, and first biasing means for resiliently urging said first toner depositing means from the position adjacent the non-color filtered electrostatic latent image to an inoperative position spaced therefrom;

means for transferring the toner powder image adhering to the electrostatic latent image recorded on said photoconductive member to a sheet of support material; and

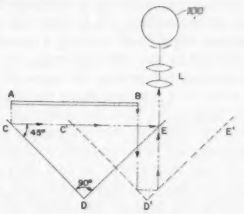
means for fusing the toner powder image to the sheet of support material.

3,869,204

SCANNING OPTICAL SYSTEM

William Peter Lanham Wilby, 59 Carleton Rise, Welwyn, England

Filed Feb. 25, 1974, Ser. No. 445,528
Claims priority, application Great Britain, Mar. 1, 1973, 9983/73
Int. Cl. G03b *27/70*
U.S. Cl. 355—66 **5 Claims**



1. A scanning apparatus for reproducing a stationary original supported in a plane upon a platen of given length, the apparatus including optical means comprising means for progressively scanning the surface of the original and a lens means for receiving the image from said scanning means, and for projecting the scanned image on a photosensitive surface moving at a given velocity, the improvement wherein: said optical means continuously scans said original and comprises two plane reflecting surfaces facing inwardly of each other and arranged symmetrically at 45° to a normal to the platen, the length of each of said reflecting surfaces resolved along the platen being greater than half of the length of the platen, said reflecting surfaces moving parallel to the platen at a velocity of one-half the velocity of said photosensitive surface to scan said original.

3,869,205

ILLUMINATION SOURCE FOR XEROGRAPHIC EXPOSURE

Charles F. Gallo, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1973, Ser. No. 392,581
Int. Cl. G03b *27/54*
U.S. Cl. 355—67 **3 Claims**

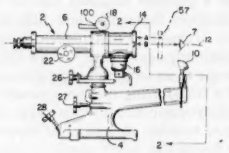
1. A xerographic system including an object surface, projection lens, an image surface in conjugate relationship to said object surface, and illumination means to irradiate objects disposed on said object surface for optimum object contrast, said illumination means being a narrow emission band light source emitting light in the yellow portion of the visible spectrum as the result of a sodium vapor discharge, and

a yellow-sensitive photoreceptor at said image surface.

3,869,206
OPHTHALMOMETER DEVICE

Joseph S. Nupuf, Canton, Ohio

Division of Ser. No. 76,171, Sept. 28, 1970, Pat. No. 3,640,610. This application Oct. 22, 1971, Ser. No. 191,854
Int. Cl. A61b 3/00
U.S. Cl. 356—2 6 Claims



1. A method of determining the topography of an optic to be employed with an opthalmometer instrument of the type which includes a target assembly having mire elements defining a target image for producing a reflected image on the surface of an optic so as to define a zone thereon, said instrument including means capable of selectively varying the position of said mire elements in infinitesimal, incremental steps within a given range between a small image and a large image, and a telescopic optical system having a telescope for viewing the reflected image on the surface of the optic and a calibrated measuring lens system capable of making a direct measurement of the zone defined by the reflected image on the surface of the optic, said method comprising the steps of:

supporting the optic at a position along the optical axis of the telescopic system so that the reflected image produced by the mire elements thereon can be viewed,

selectively positioning the mire elements with respect to the optical axis of said instrument so that they produce a reflected image of any one preselected size within said range for defining one zone on the surface of said optic, taking a direct measurement of the radius of curvature of said one zone defined by said reflected image of said one predetermined size on the surface of said optice by said instrument,

selectively repositioning said mire elements with respect to said optical axis to produce a target image of any size within said range in any size incremental step to produce at least one other reflected image of a different size than said one reflected image for defining at least one other zone on the optical surface of said optic, and

taking a direct measurement by the instrument after each time the position of the mire elements is changed for directly measuring the radius of curvature for each of the zones defined thereon to obtain as complete a determination of the curvature of as much of the entire optical surface of the optic as desired.

3,869,207
LASER TELEMETER

Pierre Hermet, St. Cyr L'Ecole, and Rodolphe Laesser, Montrouge, both of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed May 30, 1973, Ser. No. 365,328
Claims priority, application France, May 30, 1972, 72.01935
Int. Cl. G01c 3/00
U.S. Cl. 356—4 2 Claims

1. Laser telemeter comprising:

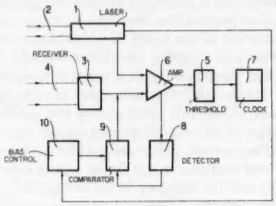
A laser generator capable of emitting a light pulse towards a target;

A photo-sensitive receiver constituted by a photodiode to receive an echo of said light pulse, said photo-diode operating in the breakdown region;

A threshold device responsive to the electric output pulses of said photodiode for blocking the electric pulses having a level lower than a predetermined threshold and for transmitting the electric pulses having a level higher than said predetermined threshold;

A measuring device triggered at the instant of emission of said light pulse and responsive to the electric pulses transmitted by said threshold device for measuring the interval of time separating the emission of said light pulse and the receiving of the electric pulse transmitted by said threshold device;

A servo-adjusting device receiving the output noise of said photo-diode and controlling the reverse polarization voltage in the breakdown state of said photo-diode to be



maintained at a first level so as to hold said noise at a constant value, said first level being sufficiently high to enable the operation of the servo-adjusting device;

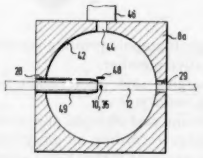
A device for lowering temporarily the bias level of said photo-diode, the duration of said lowering being less than the response time of said servoadjusting device;

Characterized in that said temporary lowering device comprises means for holding said reverse polarization voltage at a second level during the interval of time separating the emission of said light pulse and the receiving thereof by sid photodiode, said second level being lower than said first level but sufficiently high for the level of the electric pulse sent out by said photo-diode on receiving said echo to be higher than said pre-determined threshold.

3,869,208
PARTICLE-SIZE SPECTROMETERS

Gerhard Lorenz, Gottingen, Germany, assignor to Sartorius-Membranfilter GmbH, Gottingen, Germany

Filed Jan. 10, 1973, Ser. No. 322,394
Claims priority, application Germany, Jan. 28, 1972, 2204079
Int. Cl. G01n 15/02, 21/00
U.S. Cl. 356—102 12 Claims



1. A particle-size spectrometer in which a stream comprising a carrier fluid medium containing particles under test, is conducted through a slender beam of light, a photomultiplier being arranged to receive scattered light appearing on the particles, the concentration and/or size distribution of the particles being determined with reference to the output signals

of the photomultiplier, said spectrometer comprising a chamber through which said stream containing the particles and said beam of light pass, said chamber comprising an Ulbricht sphere-type photometer for measuring stray light over substantially the full solid angle, a center of stray light being formed where said stream and said beam of light intersect, said chamber having an inner surface which surrounds the center of stray light at least along an arc which extends up to the edge of the beam of light both in front of and behind the center of stray light, said inner surface having a light exit aperture therein to receive and conduct the stray light to the photomultiplier which is connected to the chamber, the cross-sectional area of the aperture being small with respect to the surface area of the sphere, and a screen positioned in the chamber to shade the aperture from receiving direct light from the center of stray light.

3,869,209

APPARATUS FOR DETERMINING THE AMOUNT OF THE DISPERSED PHASE IN A SUSPENSION

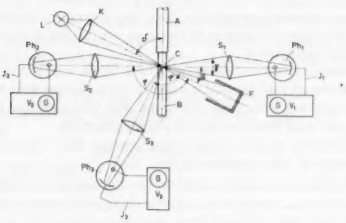
Willy Sigrist, Ennetburgen, Switzerland

Continuation-in-part of Ser. No. 237,733, March 24, 1972, Pat. No. 3,758,787. This application Sept. 4, 1973, Ser. No. 394,520

Claims priority, application Switzerland, Mar. 29, 1971, 4551/71

Int. Cl. G01n *21/00, 21/06, 21/26*

U.S. Cl. 356—103 **5 Claims**



1. Apparatus for determining the amount of the dispersed phase in a suspension comprising, in combination:

a. nozzle means for discharging said suspension as a jet having a first longitudinal axis;

b. a light source;

c. first optical means for directing light of said source toward said jet as an incident beam having an optical second axis intersecting said first axis;

d. a photoelectric element;

e. second optical means for directing light of said beam scattered by said jet on said photoelectric element and for thereby causing said element to generate an electrical signal indicative of the amount of said scattered light,

1. said second optical means having an optical third axis obliquely inclined relative to a reference plane defined by said second axis and a straight line perpendicular to said first and second axes through the point of intersection of said first and second axes,

2. said second optical means being spaced from said plane;

f. another photoelectric element;

g. third optical means having an optical fourth axis and directing light of said incident beam reflected from said jet toward said other photoelectric element,

1. the axis of the portion of said incident beam linearly transmitted by said jet and said fourth axis defining an angle of 90° to 150°;

h. light trap means spaced from said point of intersection in the direction of said second axis away from said light source for absorbing the light of said source linearly transmitted by said jet; and

i. indicating means in circuit with each of said photoelectric elements for producing a visible indication of the amount of light directed toward said elements by the associated optical means respectively.

3,869,210

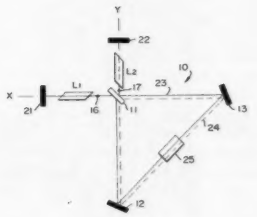
LASER SYSTEM WITH AN ANTIRESONANT OPTICAL RING

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Anthony E. Siegman, Stanford, Calif.

Filed Nov. 2, 1973, Ser. No. 412,080

Int. Cl. H01s *3/10*

U.S. Cl. 356—106 LR **14 Claims**



1. An optical system comprising:

an antiresonant optical ring including a beam splitter with a beam splitting face responsive to an optical beam directed thereto along a first axis for reflecting a first portion of said beam along a second axis, and for transmitting a second portion of said beam through said beam splitting face, and means for directing said reflected first beam portion back to said beam splitting face along said first axis and for directing said transmitted second beam portion back to said beam splitting face along said second axis, whereby said first and second beam portions circulate in said ring in opposite directions, said beam splitting face being characterized by a transmissiion coefficient definable as t_1 and a reflection coefficient definable as r_1 whereby said beam splitter reflects along said second axis some of said first beam portion which is directed thereto, and transmits some of said first beam portion along said first axis, and further reflects along said first axis some of said second beam portion which is directed thereto, and transmits some of said second beam portion along said second axis;

means exterior to said ring for directing said optical beam to said beam splitting face along said first axis; and

phase control means inside said ring for controlling the relative phases of the first and second beam portions circulating in said ring.

3,869,211

INSTRUMENT FOR MEASURING THICKNESS OF THIN FILM

Asao Watanabe; Tadayoshi Kasahara, both of Tokyo, and Noboru Sugahara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,694

Claims priority, application Japan, June 29, 1972, 47-65359; Dec. 18, 1972, 47-127424

Int. Cl. G01b *11/00*

U.S. Cl. 356—161 **10 Claims**

1. An instrument for measuring the thickness of a thin film deposited on a substrate surface comprising:

light source means for emitting light to be projected upon said substrate and film;

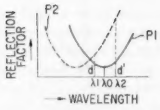
projection means for projecting alternately and in succession two light beams of different wavelengths λ_1, and λ_2 onto the substrate and film to be measured along the same light path, said two light beams being absorbed or reflected depending upon the thickness of the film to be measured;

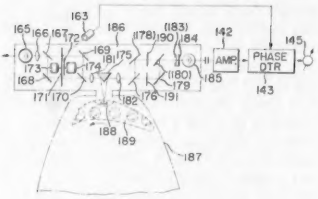
a first splitting means for splitting light beams transmitted through or reflected from the film to be measured into two bundles of light;

a first filter means comprising a first filter for transmitting only the light beam of wavelength λ_1 and a second filter for transmitting only the ligth beam of wavelength λ_2;

means for condensing said two light beams of wavelengths λ_1 and λ_2 derived from said filter means;

a photo-electric converter for converting light beams condensed by said condensing means into electric signals;





means for detecting the minimum difference between a first signal and a second signal from said converter, said first signal depending on the light beam of wavelength λ_1, said second signal depending on the light beam of wavelength λ_2.

2. An instrument defined in claim **1** wherein said light beam projection means comprises a second splitting means for splitting into two light beams the light emitted from said light source means, a second filter means comprising a third filter for transmitting only the light beam of wavelength λ_1 of the two light beams from said second splitting means and a fourth filter for transmitting only the light beam of wavelength λ_2 of the two light beams from said second splitting means, means for alternately chopping said two light beams from said second filter means, a second condensing means for condensing said two light beams from said chopping means, and a window for transmitting said two light beams derived from said second condensing means onto the substrate and film to be measured along the same light path.

3,869,212

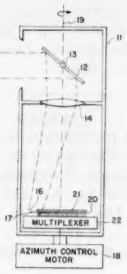
SPECTROMETER INTEGRATED WITH A FACSIMILE CAMERA

Ernest E. Burcher; Daniel J. Jobson, both of Newport News; Stephen J. Katzberg, Yorktown, and William L. Kelly, IV, Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 2, 1973, Ser. No. 385,013

Int. Cl. G01j *3/48, 3/42*

U.S. Cl. 356—189 **5 Claims**



1. Apparatus for integrating a spectrometry capability with the basic imagery function of a facsimile camera said facsimile camera including means for scanning a scene a-line-at-a-time and focusing the images of the scan on the focal plane of the camera comprising:

a plurality of photodetectors in a linear array on the focal plane of said facsimile camera such that as said facsimile camera scans a line of a scene, the image of that scan will scan said linear array of photodetectors;

a different narrow band interference filter centered over each of said photodetectors; and

multiplexing means connected to the outputs of said plurality of said photodetectors for sequentially selecting one at a time the outputs from said photodetectors as a single specific scene element is scanned down the array of photodetectors whereby the output of said multiplexer contains spectral information about said single specific scene element.

3,869,213

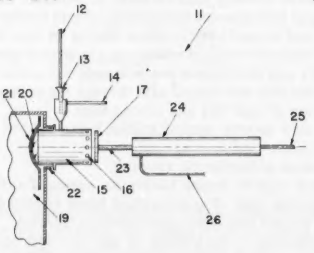
DEVICE FOR PRESENTING FIBROUS MATERIAL FOR SPECTROPHOTOMETRIC ANALYSIS

Gerald R. Greene, Anderson, S.C., assignor to Dow Badische Company, Williamsburg, Va.

Filed Jan. 11, 1974, Ser. No. 432,735

Int. Cl. G01n *21/16*

U.S. Cl. 356—244 **1 Claim**



1. A device for presenting a fibrous sample for spectrophotometric analysis, which device comprises:

a. a cylindrical chamber for containing the sample to be presented, the chamber being open at one end thereof, and having:

1. a convex, transparent wall forming the other end thereof, the outer surface of the transparent wall conforming to the interior configuration of the sample port of a spectrophotometer;
2. an inlet tube secured hermetically at one end thereof to the cylindrical chamber in the vicinity of the transparent wall and terminating at the other end thereof in an aspirator orifice for receiving fibrous material, the inlet tube communicating along the length thereof with means for the supply of a gas thereto under pressure; and
3. an exhaust aperture located in the wall of the cylindrical chamber in proximity to the open end thereof; and

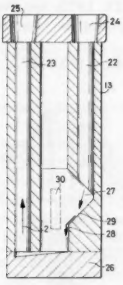
b. a piston mounted for slidable movement into and out of the cylindrical chamber, the piston being secured at its trailing surface to a rod which communicates with fluid actuating means for performing the sequential steps of:

1. positioning the leading surface of the piston within the cylindrical chamber at a location between the open end of the chamber and the exhaust aperture;
2. urging the leading surface of the piston toward the transparent wall of the cylindrical chamber at a chosen pressure; and
3. retracting the leading surface of the piston from the cylindrical chamber.

3,869,214
CUVETTE ARRANGEMENT

Bruno Egli, Rorschach, and Niklaus Manser, Goldach, both of Switzerland, assignors to Labtronic, AG, Zurich, Switzerland

Filed Apr. 24, 1973, Ser. No. 354,150
Claims priority, application Germany, Apr. 25, 1972, 2202118
Int. Cl. G01n *21/02*
U.S. Cl. 356—246 **7 Claims**



1. A cuvette for receiving a quantity of fluid for photometric absorption analysis, said cuvette being suitable for connection to a vacuum source and to a source of fluid to be analyzed and comprising:

a hollow body having an enclosing wall and floor defining an elongated chamber suitable for receiving a quantity of fluid sufficient to establish a preselected level of fluid within said chamber;

a wedge shaped recess in said enclosing wall of said chamber located below said fluid level, said wedge shaped recess having a pair of diverging faces, one of said faces slanting into said chamber;

a fluid supply conduit connectable to the fluid source and having an opening in the other of said faces for discharging fluid onto said slanting face;

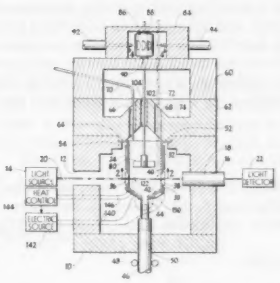
means for passing light through the fluid beneath said fluid level; and

a vacuum source connection opening into said chamber above said fluid level.

3,869,215
SAMPLE CELL ASSEMBLY HAVING A HEAT CONDUCTIVE CHAMBER SURROUNDED BY AN ELECTROTHERMAL HEATING LAYER

Gaillard R. Nolan, Acton, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed Feb. 22, 1974, Ser. No. 445,313
Int. Cl. G01n *1/10*
U.S. Cl. 356—246 **22 Claims**



1. Apparatus for containing and heating a liquid sample to a desired temperature for photometric analysis, comprising:

a cuvette having sample support walls at least the greater part of which are formed from a heat conductive material,

an electrothermal conductor distributed around the heat conductive part of said sample support walls,

said cuvette and conductor enabling the transmission of a radiation beam for photometric analysis through a sample contained within said cuvette,

circulation means for moving a sample in closed circulatory movement between the interior wall surfaces and the inner portion of said cuvette, thereby distributing heat transmitted through the sample support walls from said electrothermal conductor throughout the sample,

a temperature sensor mounted on the exterior surface of a sample support wall at a location sufficiently removed from said electrothermal conductor that the temperature of the support wall at the sensor is determined substantially by the temperature of a sample within the cuvette, means to apply an electrical energizing input to said electrothermal conductor, and

means responsive to changes in the temperature sensed by said sensing means for dynamically controlling the said electrical input, thereby enabling the energization of said electrothermal conductor to be varied in positive proportion to the differential between the sample temperature and the devised analysis temperature.

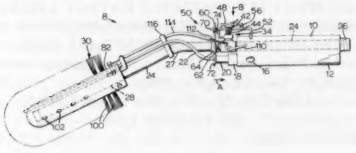
3,869,216
MANUALLY OPERATED WASHING DEVICE

Stephen Cseke, 22 Brady Cres., Downsview, Ontario, Canada

Filed Oct. 24, 1973, Ser. No. 409,266
Int. Cl. A46b *11/06*
U.S. Cl. 401—43 **5 Claims**

1. A manually operated washing device comprising: a detergent dispenser, said detergent dispenser including a detergent pump therein; a water conduit; means for connecting said water conduit to a source of water under pressure; means connected to said water conduit to spray water on an article to be washed; a water tap connected in said water conduit to

control the flow of water therethrough; a detergent conduit connected to said detergent pump for conveying pumped detergent onto said article; and combined operating means for operating said water tap and said detergent pump; said combined operating means comprising an operating member, and



linkage means connecting said operating member to said tap and to said pump, said linkage means permitting movement of said operating member in a first direction to operate said tap alone and in a second direction to operate said pump alone, and in a third direction representing said first and second directions combined, to operate said pump and tap together.

3,869,217

BALL JOINT

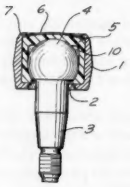
Katsuhide Nakata, 200 Plastspuma Ave., Sao Paulo, Brazil

Filed June 6, 1973, Ser. No. 367,421

Claims priority, application Brazil, June 19, 1972, 3952

Int. Cl. F16c *11/06*

U.S. Cl. 403—140 **6 Claims**



1. A ball joint, comprising a rigid socket having an end wall provided with an opening, and an open side located opposite said wall and bounded by a marginal portion; a pin having a first portion extending through said opening, and a ball-shaped second portion located with clearance in said socket; a cupped insert of resiliently yieldable material surrounding said second portion and filling said clearance, said insert having an aperture facing said opening of said socket, and a transverse wall spaced from said aperture and facing said open side, said insert having an inner circumferential surface partially in contact with said second portion and partially spaced from the same so as to define a pocket for accommodation of lubricating material; and a circular spring plate extending across said open side in retaining engagement with said marginal portion and in biased contact with said transverse wall of said insert so as to receive and transmit pressures from and to the insert in an equal and balanced manner.

3,869,218

SUPPORT STRUCTURE

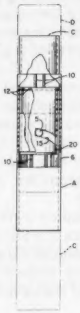
Alfred Stoeber, Parsippanny, and Bruno Smialkowski, Irvington, both of N.J., assignors to Art Shelf Product Company, Parsippany, N.J.

Filed May 7, 1973, Ser. No. 357,584

Int. Cl. F16b *7/20*

U.S. Cl. 403—241 **11 Claims**

1. A structure for detachably supporting a panel or the like comprising a first, a second and a third member having a bore therethrough, said first member having a cut-out portion in its wall serving as a receptacle for said panel, said second member being of lesser outer diameter for telescopic mounting within said first member, a heart-shaped lug with an apex in the interior of said first member and recess means in said second member comprising a vertical groove having boss means and an inclined groove contiguous therewith, whereby when said second member is telescopically mounted within said first member and rotated, said lug apex interlocks with indentations of said inclined groove, said first and third mem-



ber each having the upper portion of lesser outer size than the lower portion, whereby when the three members are assembled, an upstanding column results of uniform external dimensions, said second member having an annular flange with at least two projections at the upper end of said second member and at least two ridges in the interior of each of said first and third member, the ridges on said third member engaging said projections, said ridges extending only in the middle portion of each of said first and third member.

3,869,219

DRILL SCREW

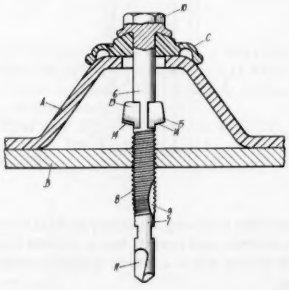
Robert Neil Wilson, 7 Redvers St., Surrey Hills, Victoria, Australia, and John James Hart, 6 Roseberry Ave., Brighton East, Victoria, Australia (3187)

Filed Oct. 29, 1973, Ser. No. 410,833

Claims priority, application Australia, Oct. 30, 1972, 1019/72

Int. Cl. F16b *5/02, 25/00*

U.S. Cl. 403—282 **5 Claims**



1. A drilling and reaming screw adapted to fasten a ribbed sheeting to a support surface, including a drilling tip, a threaded shank portion and a tool engaging head means, first reaming wings extending radially outwardly from the screw shank a predetermined radial extent and located between the threaded shank portion and the drilling tip, second reaming wings extending radially outwardly from the screw shank a predetermined radial extent greater than the radial extent of the first wings, said second reaming wings located between the head means and the threaded shank portion, an unthreaded

shank portion extending between the second reaming wings and the head means, the radial extent of the first reaming wings being slightly greater than the crest diameter of the threaded shank portion and frangibly associated with the screw shank, whereby the screw will form a first hole in the ribbed sheeting of a size capable of providing vertical support for the shank while the drilling tip penetrates the support surface and whereby the second wings will thereafter enlarge the hole in the sheeting to permit relative movement between the sheeting and support due to thermal expansion and contraction.

3,869,220
ROTARY MACHINES

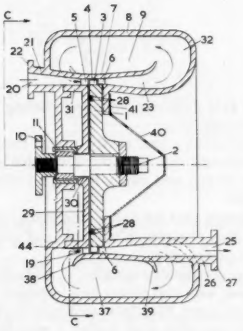
Colin Andrew Miller Tayler, Bristol, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 23, 1973, Ser. No. 335,162

Claims priority, application Great Britain, Feb. 23, 1972, 8278/72; Jan. 5, 1973, 726/73

Int. Cl. F01d *1/12*

U.S. Cl. 415—56 **10 Claims**



1. A compressor comprising a case and mounted within said case:

a. a rotor,

b. an annular aperture coaxial with said rotor and surrounding the periphery of said rotor,

c. at least one row of rotor blades circumferentially distributed on the periphery of the rotor and projecting into said annular aperture dividing the annular aperture into an upstream side and a downstream side,

d. a row of upstream stator blades radially directed and circumferentially distributed around the interior of said annular aperture, occupying the whole height of said annular aperture and disposed upstream of said row of rotor blades,

e. a row of downstream stator blades radially directed and circumferentially distributed around the interior of said annular aperture, occupying the whole height of said annular aperture, and disposed downstream of said row of rotor blades,

f. a rotor blade passage formed between said row of upstream stator blades and said row of downstream rotor blades wherein said row of rotor blades operates,

g. partitions provided in each row of stator blades, each partition occupying at least one stator blade pitch, each partition in the downstream row of stator blades being substantially opposed by a corresponding partition in the upstream row of stator blades,

h. a plurality of arcuate segmented flowpaths arranged around the periphery of the rotor intersecting said row of rotor blades in a direction substantially normal to the direction of travel of the rotor blades, each of said arcuate segmented flowpaths being formed between pairs of corresponding partitions in said upstream and said downstream rows of stator blades, the arcuate segmented flowpaths being arranged successively from a first arcuate segmented flowpath to a last arcuate segmented flowpath,

i. a plurality of confined return flowpaths, each of said return flowpaths being associated with an arcuate segmented flowpath except the last arcuate segmented flowpath, wherein each of the return flowpaths runs from the downstream side of its associated arcuate segmented flowpath to the upstream side of the next following arcuate segmented flowpath,

j. an inlet from without the case to the first arcuate segmented flowpath, and

k. an outlet from the last arcuate segmented flowpath to without the case.

3,869,221
ROTOR WHEEL FAN BLADE ADJUSTING APPARATUS FOR TURBOJET ENGINES AND THE LIKE

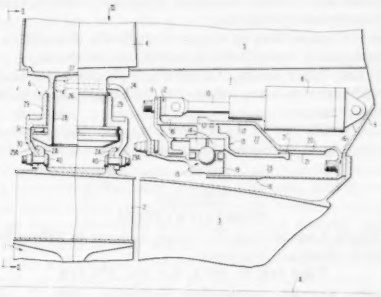
Walter Wildner, Munich, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Feb. 19, 1974, Ser. No. 443,189

Claims priority, application Germany, Feb. 16, 1973, 2307656

Int. Cl. F01d *7/00*

U.S. Cl. 415—130 **17 Claims**



1. Fan blade adjusting apparatus for adjusting fan blades on a rotor wheel of a fluid flow machine of the type having compressor blades and fan blades circumferentially around said compressor blades on a common rotatable rotor wheel with the compressor blades supplying fluid to a primary flow duct of the flow machine and with the fan blades supplying fluid to a secondary flow duct of said flow machine; said apparatus comprising:

bearing means including an inner bearing race, an outer bearing race, and antifriction means interposed between said inner and outer races for permitting relative rotation of said races with respect to one another about the axis of rotation of the rotor wheel,

actuating force applying means engageable with one of said inner and outer races for axially moving said bearing means,

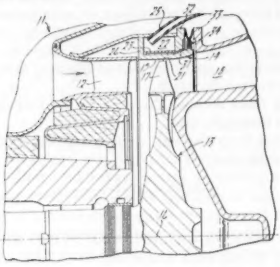
actuating force transmitting means connected to and movable with the other of said inner and outer races,

and coupling means for coupling said transmitting means to said fan blades such that axial movement of said transmitting means effects pivotal adjustment of said fan blades about fan blade pivot axes extending transverse to said axis of rotation of the rotor wheel.

3,869,222
SEAL MEANS FOR A GAS TURBINE ENGINE

Christian J. Rahnke, Roseville, and James K. Vallance, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 7, 1973, Ser. No. 368,003
Int. Cl. F01d *25/12*, *25/14*, *25/26*
U.S. Cl. 415—134 5 Claims

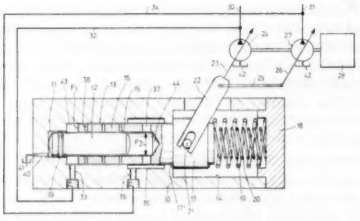


1. In a gas turbine engine having turbine rotor means constructed to rotate about a given axis,
annular shroud means surrounding said rotor means,
said shroud means including generally annular elements being axially separated to accommodate for thermal expansion of said elements,
annular seal means positioned within the axial separations between said elements,
said seal means having a pair of resiliently deformable fingers axially compressed between said elements,
said seal means having a generally Y-shaped cross section, said seal separating volumes of said engine having differing pressures,
the top of "Y" being exposed to the higher pressure whereby the pressure differential increases the sealing.

3,869,223
PUMPING SYSTEM

Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 8, 1973, Ser. No. 330,514
Claims priority, application Germany, Apr. 7, 1972, 2216680
Int. Cl. F04b *49/00*
U.S. Cl. 417—212 6 Claims

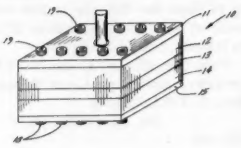


1. In a pumping system, a combination comprising a pair of pumps each having an outlet connectable with a different user; and a regulating unit for regulating the output of said pumps, comprising a housing having a first bore, a hollow regulating sleeve slidably accommodated in said first bore in operative association with said pumps for regulating the same and having one annular end face in part bounding a first pressure chamber, a piston accommodated in a second bore in said sleeve inwardly of the other annular end face of the same and having an axial end face in part bounding a second pressure chamber in said second bore, and a spring biasing said sleeve in one axial direction of the same, each of said pressure chambers communicating with a different one of said outlets.

3,869,224
ROTARY GEAR DEVICE TO PROVIDE PULSATING FLOW

Glen E. Brinkman, Oxford, Nebr. 68967

Filed Dec. 26, 1972, Ser. No. 318,601
Int. Cl. F04b *35/02*, *43/06*; F01c *1/08*
U.S. Cl. 417—383 7 Claims



1. A rotary gear device to provide pulsating fluid flow, the device comprising:
a gear block having a gear cavity formed therein and a hole formed through one wall thereof which communicates with said cavity, said cavity having an inlet port and an outlet port;
a toothed power gear rotatably mounted in said cavity and having a shaft disposed in said hole and projecting axially from said power gear;
a first idler gear rotatably mounted in said cavity in meshing engagement with said power gear, wherein said gears are operable to pump fluid from said inlet port to said outlet port, said first idler gear having a plurality of adjacent mutilated teeth formed by removing a portion of said teeth and a portion of the gear hub adjacent thereto, thus maintaining said meshing engagement during a full revolution of said first idler gear and creating a passage between said gears during a portion of said revolution;
a fluid reservoir disposed in said gear block and fluidly connected to said inlet port;
a discharge conduit formed in said gear block and fluidly connected to said outlet port;
barrier means mounted in said discharge conduit, said barrier means being sequentially moveable between a first position and a second position by displacement of fluid in said discharge conduit; and
a second idler gear rotatably mounted in said cavity and disposed opposite said first idler gear in meshing engagement with said power gear, said second idler gear having a plurality of mutilated teeth formed by removing a portion of said teeth and a portion of the gear hub adjacent thereto, thus maintaining said meshing engagement during a full revolution of said second idler and creating a passage between said power gear and said second idler gear during a portion of said revolution, said cavity having a second inlet port and a second outlet port, wherein said gears are operable to pump fluid from said second inlet port to said second outlet port, said second inlet port fluidly connected to said reservoir, a second discharge conduit formed in said gear block and fluidly connected to said second outlet port, and second barrier means being sequentially moveable between a first position and a second position by displacement of fluid in said second discharge conduit.

3,869,225

METERING APPARATUS

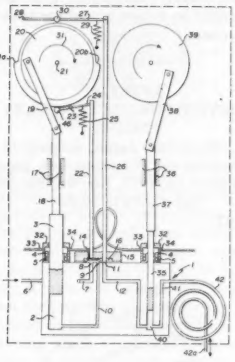
Paul Sommer, Pratteln, and Hansjorg Tschirky, Ettingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 23, 1972, Ser. No. 265,890

Claims priority, application Switzerland, July 6, 1971, 9906/71

Int. Cl. F04b *39/00*

U.S. Cl. 417—430 6 Claims



1. A metering pump comprising a chemically inert pump body having a bore formed therein, a piston operably positioned in said bore, a fluid receiving chamber associated with said pump body, a portion of said fluid receiving chamber being defined by a wall comprising a part of said pump body, another portion of said fluid receiving chamber being defined by the inner surface of a flexible member, portions of said flexible member being selectively movable, one end of an inlet conduit means, a connecting conduit means and an outlet conduit means opening into said fluid receiving chamber, the other end of said connecting conduit means being operably associated with said bore, the said flexible member having a first stoppering portion in one position of the flexible member adapted to overlie said inlet conduit, and a second stoppering portion in another position of the flexible member adapted to overlie said outlet conduit, a first actuating member secured to said flexible member and adapted to move said first stoppering portion between positions, whereby said one end of said inlet conduit means is opened or closed, a second actuating member secured to said flexible member and adapted to move said second stoppering portion between positions, whereby said one end of said outlet conduit means is opened or closed, actuating means comprising a control disc having an irregular boundary surface, and power source means for moving the control disc, said actuating means operationally connected to said piston means and said first and second actuating members whereby the first stoppering portion opens and the second stoppering portion closes on the suction stroke of the piston means and the first stoppering portion closes and the second stoppering portion opens on the pressure stroke of the piston means, and a second pump comprising a second bore formed in the pump body and a second piston operably positioned in said second bore, coupled via a piston rod means, guided vertically in a support means, a connecting rod means with a second crank disc adapted with a second power source means, is operably connected to the outlet conduit and has a helical conduit connected to said second bore.

3,869,226

FUEL PUMPING APPARATUS

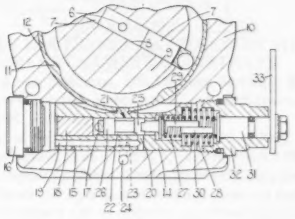
Stanislaw Jan Antoni Sosnowski, London, England, assignor to C.A.V. Limited, Birmingham, England

Filed Sept. 12, 1973, Ser. No. 396,534

Claims priority, application Great Britain, Sept. 12, 1972, 42272/72

Int. Cl. F04b *19/02*

U.S. Cl. 417—462 5 Claims



1. A liquid fuel pumping apparatus for supplying fuel to an internal combustion engine, the apparatus being of the kind comprising a plunger located within a bore, cam means for effecting movement of the plunger, a fluid pressure operable piston for adjusting the setting of the cam means, an axially movable servo-valve for controlling the application of fluid pressure to the piston, said servo valve being subjected to a fluid control pressure generated within the apparatus, the apparatus also including a manual control whereby the quantity of fuel supplied to the engine at each injection stroke of the apparatus can be varied, a bore formed in the piston, said piston bore slidably accommodating said servo valve, passage means conveying said fluid control pressure so that it can act on the valve in opposition to the force exerted by resilient means, a port formed in the wall of the piston bore and through which fluid can flow to and escape from the cylinder accommodating the piston, a control land on said servo valve for controlling fluid flow through said port, said servo-valve and piston constituting a follow-up servo-system, means coupling said servo-valve with said manual control, said land being shaped so that angular movement of the servo-valve will, for a given axial position of the servo-valve, effect uncovering of the port thereby to cause axial movement of the piston and adjustment of said cam means.

3,869,227

VARIABLE CAPACITY ROTARY SCREW COMPRESSOR HAVING VARIABLE HIGH PRESSURE SUCTION FLUID INLETS

Erich J. Kocher, Milwaukee, and Whitney I. Grant, Muskego, both of Wis., assignors to Vilter Manufacturing Corporation, Milwaukee, Wis.

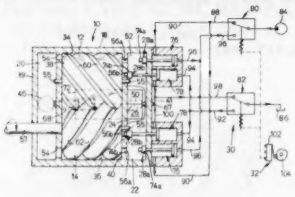
Filed Mar. 8, 1974, Ser. No. 449,263

Int. Cl. F01c *1/16*

U.S. Cl. 418—15 14 Claims

10. A variable capacity rotary screw compressor comprising: a housing having a low pressure suction fluid chamber, a high pressure suction fluid chamber and a fluid discharge chamber, a low pressure fluid inlet port connected to said low pressure chamber, a high pressure fluid inlet port connected to said high pressure chamber and a discharge port connected to said discharge chamber, a pair of oppositely rotating constant mesh rotors having helical lands and intervening grooves defining working chambers, said rotors being mounted within said housing to provide pumping and compressing action, said working chambers being connected at one end to draw fluid from the low pressure chamber and at the other end to discharge compressed fluid to the discharge chamber, means for selectively providing fluid communication between said high

pressure fluid chamber and said working chambers, a slide valve movably mounted within said housing and including cut off means for controlling the capacity of said compressor, and means connected to said slide valve and to the high pressure



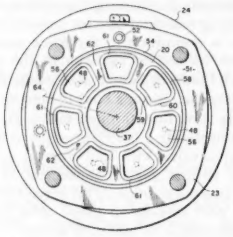
fluid communicating means for controlling the point of admission of high pressure fluid from said high pressure chamber to said working chamber in relation to the position of said slide valve.

3,869,228

AXIAL PRESSURE BALANCING MEANS FOR A HYDRAULIC DEVICE

Nils Einar Swedberg, Chanhassen, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 21, 1973, Ser. No. 362,588
Int. Cl. F01c *19/08*
U.S. Cl. 418—132 **4 Claims**



1. An axial pressure-balancing system for use in a rotary hydraulic device of the type including an internally-toothed member and an externally-toothed member eccentrically disposed within said internally-toothed member for relative orbital and rotational movement therebetween, said members defining a plurality of volume chambers by tooth interaction therebetween, each of said volume chambers sequentially expanding and contracting during each relative orbit between said members, each of said volume chambers having a maximum cross-sectional area on a plane generally parallel to the plane of said rotational movement, the device further including commutator-type valve means for sequentially communicating high pressure fluid and low pressure fluid to each of said volume chambers during each relative orbit to define a pressure pattern rotating at the speed of said relative orbital movement between said members, said axial pressure-balancing system comprising:

a. a relatively thin sealing plate in generally sealing engagement with an axial end face of each of said toothed members;

b. a balancing member in engagement with an end face of said sealing plate, said sealing plate being disposed between said toothed members and said balancing members;

c. said sealing plate defining a plurality of fluid passages extending therethrough, each of said fluid passages being in fluid communication with one of said volume chambers;

d. said balancing member defining a plurality of sealed balancing areas, each of said balancing areas being in constant communication with one of said fluid passages and its associated volume chamber to contain, sequentially, both high pressure fluid and low pressure fluid during each relative orbit; and

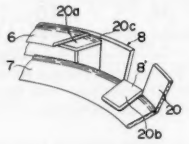
e. each of said balancing areas being at least slightly larger than said maximum area of said volume chambers, to provide a net force on said sealing plate, in the area adjacent each of said balancing areas, biasing said sealing plate toward sealing engagement with said externally-toothed member to minimize leakage between adjacent volume chambers.

3,869,229

SEALING DEVICE FOR USE IN ROTARY PISTON ENGINE

Noriyuki Kurio, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima-shi, Hiroshima-ken, Japan

Filed Mar. 26, 1973, Ser. No. 344,557
Int. Cl. F01c *19/00*
U.S. Cl. 418—142 **9 Claims**

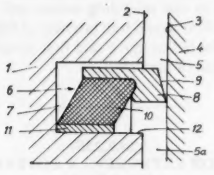


1. A sealing device for use in a rotaty piston internal combustion engine having a rotor eccentrically rotatably accommodated in a rotor cavity formed by a center housing having a substantially epitrochoidally shaped bore for said rotor cavity and a pair of end walls secured to both ends of said center housing, said rotor having an annular groove on each of the opposite side surfaces of said rotor defined by a pair of outer and inner groove faces, the plane of each of which lies in parallel relation to the longitudinal axis of said rotor, and a bottom face facing towards a corresponding end wall; said sealing device comprising a first, substantially circularly curved sealing strip means and a second, substantially circularly curved sealing strip means, both slidably accommodated within said groove for sliding in a direction parallel to the longitudinal axis of the rotor; first biasing means for biasing said first and second sealing strip means flat against the respective groove faces in the radially outwards and inwards directions, respectively, comprising a circular member made of elastically deformable metallic material and having a plurality of elastic tongue members alternately radially outwardly and inwardly bent from the plane of said circular member in the same direction at intervals, a set of said tonuge members which are radially outwardly bent from said circular member acting to press one sealing strip means against the one groove face while another set of the tongue members, which are radially inwardly bent from said circular member act to press the other sealing strip means against the other groove face, and second biasing means within said groove for biasing said first and second sealing strip means outwardly of said groove, thereby causing one end face of each of said sealing strip means adjacent to the opening of said groove to tightly but slidably contact the corresponding end wall.

3,869,230
INTERNAL SEAL FOR THE PISTON OF A ROTARY ENGINE

Wolfgang Schmadeke, Cacilienstrabe 29, Heilbronn, and Gottlieb Wilmers, Friedhofstrabe 25, Neuenstadt, both of Germany

Filed Apr. 2, 1973, Ser. No. 346,761
Claims priority, application Germany, Apr. 8, 1972, 2216965
Int. Cl. F01c *19/00;* **F04c** *15/00, 27/00*
U.S. Cl. 418—142 **8 Claims**

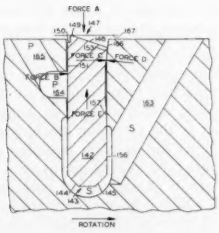


1. An internal seal for the piston of a rotary piston engine of trochoid type having a housing with two end parts and with a shell, having multi-arcuate interior surface, in which housing the piston is rotatably mounted on an eccentric, said internal seal having an axially movable scraper ring held in spring contact with the adjacent end wall of the housing, a coaxial supporting ring, a rubber-like elastic ring being adapted to be separated from the piston by the supporting ring, the scraper ring fixedly united to the coaxial supporting ring by the rubberlike elastic ring which is stressed predominantly in shear when the scraper ring moves axially relative to the supporting ring, the scraper ring, the elastic ring and the supporting ring being fixedly united and undetachably interconnected to form and function as a single unit.

3,869,231
VANE TYPE FLUID ENERGY TRANSLATING DEVICE

Cecil E. Adams, Columbus, Ohio, assignor to Abex Corporation, New York, N.Y.

Filed Oct. 3, 1973, Ser. No. 403,125
Int. Cl. F01c *1/00;* **F03c** *3/00;* **F04c** *1/00*
U.S. Cl. 418—267 **15 Claims**

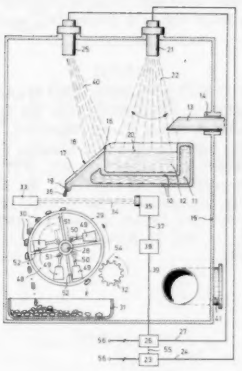


1. A vane type fluid energy translating device comprising: a stator; a rotor; a cam surface formed on the stator; a plurality of vane slots formed in the rotor; a vane positioned in each vane slot for movement relative thereto and having a leading face, a trailing face, an inner end within the vane slot and an outer sealing lip engageable with the cam surface on the outer end thereof; wherein rotation of the rotor causes each vane to sequentially traverse intake, transfer, exhaust and sealing zones; each vane being subjected to a fluid at high pressure and a fluid at low pressure creating a pressure differential between the leading and trailing faces while traversing the transfer and sealing zones; said pressure differential in at least one of said zones creating a first force on one vane face thrusting each vane against the vane slot as the vane traverses said zone, said fluid at high pressure creating a second force on the outer end of the vane tending to bias the vane into its slot, means connecting the entire inner end of said vane to fluid at low pressure in said one zone; and cooperating means on each vane and the vane slot for effecting a mechanical reaction force opposing said first force which mechanical reaction force has a component greater than said second force biasing the vane outwardly of its slot and into engagement with the cam surface.

3,869,232
APPARATUS FOR PREPARING PELLETS BY MEANS OF BEAMS OF CHARGED PARTICLES

Waldemar Ruus, Somborn, and Herbert Stephan, Bruchkoebel, both of Germany, assignors to Leybold-Heraeus Verwaltung GmbH, Koln-Bayental, Germany

Division of Ser. No. 124,330, March 15, 1971,. This application June 13, 1973, Ser. No. 369,435
Int. Cl. B29c *23/00;* **B22d** *23/08*
U.S. Cl. 425—6 **4 Claims**



1. Apparatus for preparing pellets by melting of a starting material by means of a beam of charged particles in a vacuum or under a protective gas and by subsequently solidifying individual drops of the melt on a cooling surface, comprising at least one electron beam generator, a material feeding device, a melt container with dripping arrangement, and a cooling surface arranged below the drip-pin arrangement, said cooling surface being arranged predominantly in the radiation shadow of said melt container relative to said electron beam acting on the melt.

3,869,233
APPARATUS FOR RAPID ISOSTATIC PRESSING

Donald E. Witkin, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Division of Ser. No. 359,224, May 11, 1973,. This application May 28, 1974, Ser. No. 474,017
Int. Cl. B30b *5/02, 11/02, 3/00*
U.S. Cl. 425—78 **11 Claims**

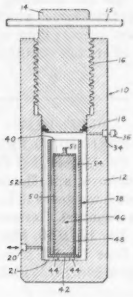
1. Apparatus for compacting a preheated porous body by isostatically hot pressing the same comprising

a pressure vessel,

means for rapidly filling said pressure vessel with a liquid pressurizing medium and for rapidly increasing the pressure of said medium within said pressure vessel to a preselected compacting pressure,

means for releasing the pressure within said pressure vessel at said preselected pressure,

means for emptying said pressurizing medium from said pressure vessel, and



means for avoiding contact of said pressurizing medium with said body until said pressure vessel is substantially completely filled with said pressurizing medium.

3,869,234

APPARATUS FOR MOLDING AND MEANS FOR TRANSFERRING A PREFORM FOIL TO THE MOLD

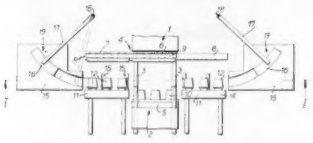
Brian Leo Chudleigh Sutch, Great Bookham, England, assignor to Airfix Industries Limited, London, England

Continuation of Ser. No. 160,469, July 7, 1971, abandoned. This application May 25, 1973, Ser. No. 364,091

Claims priority, application Great Britain, July 17, 1970, 34930/70; Dec. 9, 1970, 58558/70; Dec. 12, 1970, 1460/71

Int. Cl. B29d *3/00*

U.S. Cl. 425—112 **10 Claims**



1. The combinations of a moulding machine and a mechanism for feeding a foil to the moulding machine, the moulding machine comprising:

a. first and second mould tools;

b. means for moving said mould tools relative to each other in a moulding station to and from a moulding position in which said mould tools co-operate to define a mould cavity; and

c. means for moving said first mould tool laterally out of said moulding station; the mechanism comprising:

a. a carriage movable between first and second stations;

b. drive means for moving the carriage between said first and second stations;

c. a foil carrier comprising a body having an axis of symmetry and defining a circumferential surface for receiving a foil, port means in the circumferential surface and means for connecting said port means to a source of fluid at subatmospheric pressure;

d. means mounting said carrier on the carriage for rotation about said axis of symmetry;

e. drive means for rotating said carrier;

f. positioning means for positioning a foil tangentially of said circumferential surface of said carrier when said carriage is in said first station; and

g. control means for connecting said source of fluid at subatmospheric pressure to said ports and for causing said carrier drive means to be energised to rotate said carrier to cause a foil positioned by said positioning means tangentially of said carrier surface to be progressively applied to said surface when said carriage is in said first station, and for disconnecting said source of fluid from said ports when said carriage is in said second station and wherein the mechanism is mounted on said moulding machine such that the direction of movement of said carriage between said first and second stations is generally parallel to said direction of movement of said mould tools in said moulding station and said means for moving said first mould tool laterally of the said moulding station is adapted to move said first mould tool into said second station of said carriage.

3,869,235

APPARATUS FOR EXTRUDING A COVERING ON TO A CABLE CORE

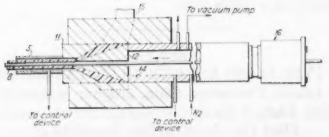
Alexander Joseph Moore, Marlow, England, assignor to British Insulated Callender's Cables Limited, London, England

Filed June 18, 1973, Ser. No. 370,817

Claims priority, application Great Britain, June 19, 1972, 28682/72

Int. Cl. B29f *3/10*

U.S. Cl. 425—113 **7 Claims**

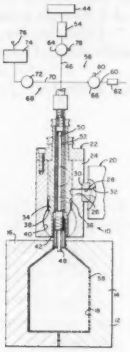


1. Apparatus for extruding a covering on to an advancing core and for continuously treating the covering with a fluid medium at super-atmospheric pressure, which apparatus comprises an extrusion machine comprising a core tube extending through the extrusion machine, and an annular extrusion orifice at the outlet of the extrusion machine defined by an outer die and an inner die or point mounted on the downstream end of the core tube; sealing means associated with the core tube which permits passage of the core therethrough; a treatment chamber which is hermetically sealed to the outlet end of the extrusion machine and through which the covered core emerging from the extrusion orifice is adapted to pass; means for introducing a fluid medium under super-atmospheric pressure into the treatment chamber; and means for injecting a fluid under pressure to the interior of the core tube, wherein the sealing means comprises at least one inflatable collar associated with the core tube in such a way that it will surround a core advancing through the bore of the core tube; and, positioned between the collar and said advancing core, a radially inner layer of a heat-resistant material of a low coefficient of friction; the arrangement being such that when the inflatable collar is at least partially inflated it will be constrained to effect a circumferential compressive force radially inward on the inner layer of heat-resistant material to cause the collar and the inner layer to effect a substantially fluid-tight seal between the core tube and the advancing core.

3,869,236
MOLDING APPARATUS INCLUDING ARTICLE COOLING

Roger L. Schonewald, Belle Mead, N.J., assignor to Improved Machinery Inc., Nashua, N.H.

Division of Ser. No. 295,591, Oct. 6, 1972, Pat. No. 3,807,927. This application Nov. 12, 1973, Ser. No. 415,146
Int. Cl. B29d *23/03*
U.S. Cl. 425—144 **7 Claims**



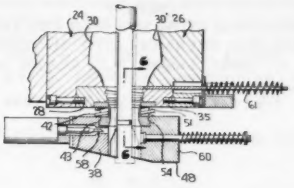
1. Apparatus for blow molding a hollow article from plasticized material, comprising mold means defining a mold cavity contoured to the configuration of the article to be blow molded, means for supplying a parison of plasticized material to said mold means, conduit means for supplying pressurized blowing fluid to said mold means internally of a parison therein whereby such fluid blows the parison to the configuration of the article, and article cooling means for repeatedly causing the pressure of fluid within a blown article in said mold means to be alternately decreased and increased, whereby repeatedly fluid is alternately discharged from and additional cooling fluid is supplied to, the interior of the article for cooling the article, said article cooling means comprising receiver means communicating with said conduit means, piston means associated with said receiver means and cyclically driven to initiate such pressure decrease and increase only after the blowing of the article to the configuration of the mold cavity, exhaust conduit means, and means for controlling fluid flow through said conduit means and said exhaust conduit means.

3,869,237
MOLD ASSEMBLY

Ernest W. Hellmer, Chicago, and John P. Kinsley, Hanover Park, both of Ill., assignors to Continental Can Company, New York, N.Y.

Filed Dec. 20, 1972, Ser. No. 316,926
Int. Cl. B28b *7/14, 11/12*
U.S. Cl. 425—292 **24 Claims**

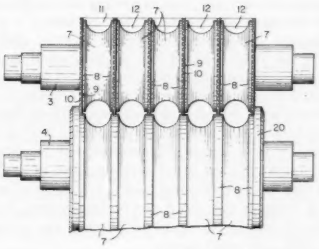
1. A mold cavity having generally radially moveable means for blow molding a hollow member having a tubular end portion including a transverse shoulder, and axially moveable cutter means for trimming the hollow member at the transverse shoulder thereof while the hollow member is still in said mold.



3,869,238
CANNELON AND STUFFED SPAGHETTI MOLDING APPARATUS

Terenzio Racca, c/o Jorge Newbery, no. 3261/63 St., Buenos Aires, Argentina

Filed Nov. 15, 1973, Ser. No. 416,271
Int. Cl. A21c *11/04, 11/24*
U.S. Cl. 425—294 **10 Claims**



1. In an apparatus for working on a deformable, compressible material, a pair of rollers respectively having parallel axes of rotation and respectively having pairs of peripheral edges situated in a pair of planes which are perpendicular to said axes, the peripheral edges of one of said rollers engaging the peripheral edges of the other of said rollers along a line of contact which is parallel to said axes and which is in a plane which contains said axes, each of said rollers being formed between its peripheral edges with a circumferential groove so that said grooves form in said plane which contains said axes an opening extending across said line of contact, so that said rollers provide in each of said planes perpendicular to said axes a pair of engaging peripheral edges, and one of each pair of peripheral engaging edges being a circumferential cutting edge while the other of each pair of engaging peripheral edges is a circumferential anvil surface to be engaged by the circumferential cutting edge, and one of said rollers carrying an axially extending cutting blade extending between the peripheral edges of the latter roller and having an outer cutting edge extending parallel to the axis of the latter roller and directed away from the latter axis, said axially extending cutting blade having an inner edge directed toward the latter axis and said groove in the roller which carries said cutting blade extending closer to the axis of the latter roller than the inner edge of said cutting blade to define a gap with said inner edge, and transmission means interconnecting said rollers for rotating one of the rollers in a direction opposite to the other of the rollers, so that a material fed between the rollers will be shaped in accordance with the configuration of the opening defined by the grooves in the plane which contains said axes of rotation

and will be cut longitudinally at the peripheral engaging edges and transversely by said axially extending blade.

3,869,239

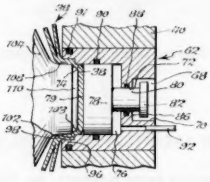
APPARATUS FOR BLOW MOLDING AND TRANSFER MOLDING THERMOPLASTIC MATERIAL

Raymond C. Confer, Gasport, N.Y., assignor to Air-Lock Plastics, Inc., Tonawanda, N.Y.

Filed Nov. 30, 1972, Ser. No. 310,896

Int. Cl. B29d *23/03*

U.S. Cl. 425—302 B **11 Claims**



1. A molding apparatus for forming a hollow body having a predetermined wall portion comprising: a pair of mold sections when engaged forming a mold cavity having the shape of the finished body, means introducing thermoplastic material between said mold sections, means closing said mold sections about said thermoplastic material for enclosing a portion thereof, opposed surfaces on said mold sections defining a space having the shape of said wall portion when said mold sections are closed, and opposed means on said mold sections defining a well adjacent said space for accumulating a portion of said thermoplastic material, said opposed means displacing at least a portion of said accumulated material from said well to said space to form said predetermined wall portion upon closing movement of said mold sections, one of said mold sections having fluid conducting means, and means for introducing fluid through said fluid conducting means into said enclosed thermoplastic material to expand the same into conformity with said mold cavity.

3,869,240

PLASTIC FILMS

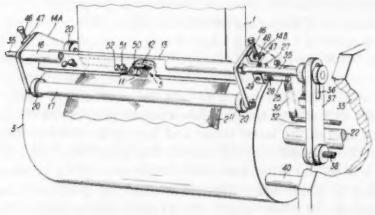
John K. P. Mackie, and Samuel McMeekin, both of Belfast, Northern Ireland, assignors to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Nov. 1, 1973, Ser. No. 411,826

Claims priority, application Great Britain, Nov. 7, 1972, 51233/72

Int. Cl. B29c *23/00*

U.S. Cl. 425—374 **16 Claims**



1. Apparatus for the profiling of films of synthetic organic polymers comprising a profiling member and a member cooperating with said profiling member to form a nip for the passage of film to be profiled, one of the said members being in the form of a roller having an axis and the other said member being static, means mounting said members in cooperating relationship whereby said members are yieldingly biased together and a spacer member, said spacer member bearing against the surface of said roller and being connected to said static member in such a way that any deviations of said roller surface from the concentric react against said spacer member so as to produce relative movement between said axis of said roller and said static member whereby to maintain the width of said nip between said roller surface and said static member at a predetermined value.

3,869,241

DEVICE FOR RAPID CLOSURE AND PRESSURIZATION OF A COMPRESSION CHAMBER

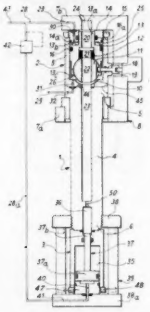
Jacques David, and Guy Gay, both of Orange, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 7, 1974, Ser. No. 431,510

Claims priority, application France, Jan. 11, 1973, 73.00887

Int. Cl. B30b *5/02, 11/00*

U.S. Cl. 425—405 H **11 Claims**



1. A device for the rapid closure and pressurization of a compression chamber comprising closure means mounted on a first extremity of the compression chamber, a pressure multiplier in communication with the second extremity of said chamber, pressure application means for the closure means and the pressure multiplier, wherein said closure device comprises:

rapid closure means comprising an obturator with a removable jack disposed in a frame which is rigidly fixed to the compression chamber,

a valve-seat lining applied against the first extremity of said chamber by said jack which is subjected to the action of means for application of pressure,

an aperture formed in the base of the second extremity of said chamber and adapted to communicate with tthe pressure multiplier which is actuated by the pressure-application means.

3,869,242

PROCESS FOR VAPORIZING FUEL OIL

Hermann J. Schladitz, Plantschwez 74, Munich, Germany

Filed Dec. 21, 1973, Ser. No. 427,319

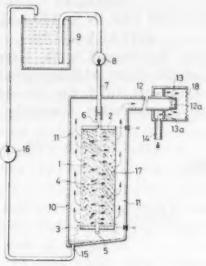
Claims priority, application Germany, Dec. 21, 1972, 2262673

Int. Cl. F23d *11/44*

U.S. Cl. 431—11 **5 Claims**

1. A process for vaporising fuel oil by passing liquid oil through a heated, porous, substantially cylindrical body con-

sisting of polycrystalline metal whiskers connected with one another metallically at their points of contact, whereby the

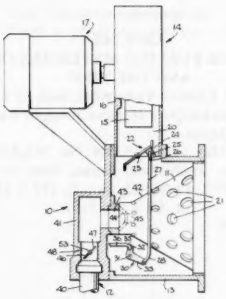


improvement comprises passing the oil radially, from inside to outside, through the body and supplying more fuel oil to the porous body than is vaporised.

3,869,243
AIR/FUEL RATIO CONTROL MEANS FOR DUAL FUEL BURNERS

Walter R. Creuz, Chatham, N.J., assignor to Aero-Flow Dynamics, Inc. (The Wing Company Division), Linden, N.J.

Filed Nov. 2, 1973, Ser. No. 412,483
Int. Cl. F23n *1/02*
U.S. Cl. 431—90 **7 Claims**

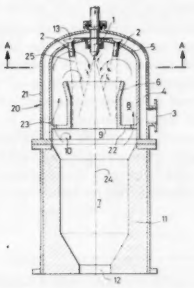


1. In a burner of the type having a combustion chamber, fuel inlet means and air inlet means for admission of fuel and air to the combustion chamber, metering valve means in said fuel inlet means and damper means in said air inlet means, and a linkage between said metering valve means and said damper means, the improvement comprising means permitting lost motion in said linkage for permitting said metering valve means to be partially opened while the damper means remains closed and for opening said damper means only after said metering valve has been opened to a predetermined extent.

3,869,244
BURNER UNIT

Robert Von Linde, Akilindastr. 56; Joachim Von Linde, both of Grafelfing, and German Kurz, Karlsfeld, all of Germany, assignors to said Robert von Linde, by said Joachim von Linde and German Kurz

Filed Jan. 14, 1974, Ser. No. 432,955
Claims priority, application Germany, Jan. 24, 1973, 2303280
Int. Cl. F23m *3/14*
U.S. Cl. 431—116 **7 Claims**

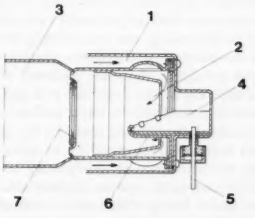


1. A burner unit comprising combustion chamber means, prechamber means, means to enable combustion gases to pass from said combustion chamber means into said prechamber means, mixing pipe means in communication with said prechamber means and said combustion chamber means, a fuel supply nozzle for distributing finely divided fuel towards said mixing pipe means into said recirculated combustion gases, and means for supplying oxygen-containing gas to the mixture of fuel and combustion gases, wherein said means for supplying oxygen-containing gas comprises a plurality of exit openings arranged symmetrically about the longitudinal axis of said fuel supply nozzle, said means for supplying oxygen-containing gas comprises pipes extending into the prechamber and arranged symmetrically about the fuel supply nozzle, the interstices between adjacent pipes forming passageways for the recirculated combustion gases into the space of the prechamber surrounding the fuel supply nozzle.

3,869,245
VAPORIZING BURNER DEVICE

Gustav Rune Hagman, Varberg, Sweden, assignor to Monark-Crescent AB., Varberg, Sweden

Filed May 21, 1973, Ser. No. 361,965
Claims priority, application Sweden, June 14, 1972, 7377860
Int. Cl. F23d *3/40*
U.S. Cl. 431—326 **3 Claims**



1. A vaporizing burner device comprising a flame chamber surrounded by spaced apart inner and outer elongated casings

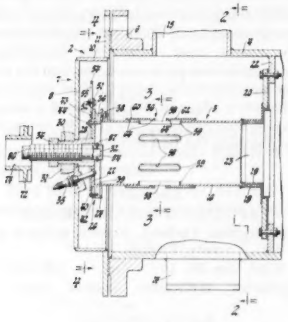
forming an air passage into the flame chamber, the inner elongated casing terminating at one end in a flame holding baffle having a first central opening therein for enabling the egress of the spent combustion gas, the inner elongated casing terminating at the other end in a second central opening aligned with said first central opening for enabling the total ingress of fresh air from said passage, the elongated outer casing having an opening at one end for the intake of fresh air and being closed at the other end for directing air in the air passage through said second central opening, through said flame chamber and toward said first central opening, an elongated spoon bowl shaped body of heat conductive material lined on the inside of the bowl with a coating of capillary acting insulating material, means for supporting said spoon bowl with the elongated axis of the bowl being generally aligned with the elongated axis of said elongated casings, said bowl having a tip end extending from the inside of the outer casing through said second central opening and into said chamber with substantially free passage of said ingress air surrounding said bowl and moving toward said tip end, said bowl having a rear end extending back from said second central opening toward the closed end of said outer casing, and fuel inlet means for conveying liquid fuel into the rear end of said bowl at a rate whereby the capillary action of the insulating material conveys the fuel over the inside surface of the spoon bowl.

3,869,246

VARIABLE CONFIGURATION COMBUSTION APPARATUS

Dean C. Hammond, Jr., Warren, and Galal N. Matta, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 26, 1973, Ser. No. 428,430
Int. Cl. F23d *15/00*
U.S. Cl. 431—351 **3 Claims**



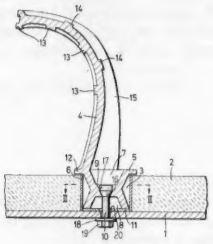
1. A combustion apparatus comprising a casing having an air inlet, a combustion liner of generally cylindrical configuration mounted in the casing, the liner having an upstream end and having a downstream end communicating with an outlet for combustion products, the liner defining primary air entrance means adjacent to the upstream end and secondary air entrance means intermediate the ends; and means adjacent to the upstream end for distributing fuel into the primary air; the said apparatus being characterized by variable configuration secondary air entrance means comprising a ring of ports through the liner; two valve sleeves reciprocable lengthwise of the liner, one sleeve being effective to obstruct variably the upstream ends of the ports and the other sleeve being effective to obstruct variably the downstream ends of the ports; and means for reciprocating the sleeves concurrently in the same direction to vary the effective location of the secondary air entrance means and for reciprocating the sleeves concurrently in opposite directions to vary the effective area of the secondary air entrance means.

3,869,247

COOLING PIPE FOR USE IN SATELLITE COOLERS OF ROTARY KILNS

Herbert Deussner, Bensberg-Refrath, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft

Filed Feb. 13, 1974, Ser. No. 442,085
Claims priority, application Germany, Feb. 14, 1973, 2307108
Int. Cl. F27b *7/14*
U.S. Cl. 432—80 **9 Claims**



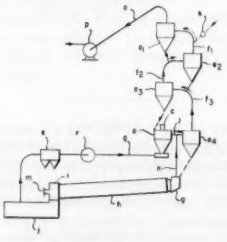
1. A cooling pipe for a satellite cooler on a rotary kiln, comprising:
a pipe wall,
an inner wall having a fireproof lining,
a material lifting blade arranged on the inner wall,
a recess in said inner wall for said lifting blade, said recess extending to said pipe wall,
a metal sleeve lining said recess,
a metal plate between said sleeve and said pipe wall,
an aperture in said pipe wall,
a fastening foot on said blade, and
a fastening device extending through said aperture to fasten said foot to said pipe wall.

3,869,248

APPARATUS FOR BURNING MATERIALS OF CEMENT AND THE LIKE

Yoshio Hirai, and Yoshimi Yamamoto, both of Tokyo, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan

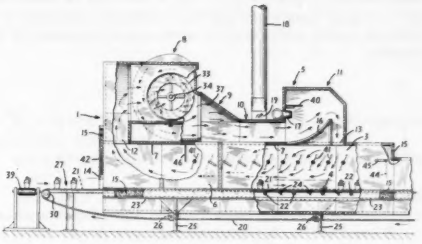
Filed May 18, 1973, Ser. No. 361,437
Claims priority, application Japan, May 20, 1972, 47-58985; Oct. 4, 1972, 47-99552; Jan. 8, 1973, 48-5032
Int. Cl. F27b *7/02*
U.S. Cl. 432—106 **2 Claims**



1. A suspension type rotary kiln apparatus for burning the materials of cement, comprising

a. a calcinating furnace (**1**) having at its bottom a combustion air inlet and at its top a feed inlet (**5**) and an exhaust gas outlet, said furnace including also a plurality of burners (**2, 3, 4**) for establishing a given burning ratio;
b. suspension preheater means including a plurality of cyclones (**8, 9, 10**) for feeding preheated raw meal to the feed inlet of said furnace;
c. a cyclone (**11**) having an inlet connected with the exhaust gas outlet of said furnace, said cyclone having an exhaust gas outlet connected with the lower portion of said suspension preheater means, and a raw meal outlet;
d. exhaust fan means (**23**) connected with the upper portion of said suspension preheater means for drawing exhaust gases therethrough;
e. rotary kiln means (**16**) having at one end an inlet chamber (**15**) provided with an inlet connected with the raw meal outlet of said cyclone, said inlet chamber including also an exhaust gas outlet, said rotary kiln means including at its other end an outlet;
f. cooler means (**18**) having an inlet connected with the outlet of said kiln means for receiving the burnt materials produced thereby, said cooler means including also a combustion air outlet;
g. a secondary air duct (**6**) connecting the combustion air outlet of said cooler means with the combustion air inlet of said calcinating furnace;
h. a branch duct (**21**) containing a reduced portion defining an orifice (**25**) for connecting the exhaust gas outlet of said inlet chamber with said secondary air duct adjacent said furnace, whereby the high temperature exhaust gas from the kiln is mixed with the high temperature combustion air from the cooler; and
i. damper means (**26, 27**) in said secondary air duct intermediate said cooler and said branch duct for regulating the quantity of the combustion air from the cooler that is mixed with the high temperature exhaust gases from the kiln and is supplied to the furnace, said damper means being so adjusted and the restriction of the orifice in said branch duct being so dimensioned that the pressure loss in the secondary duct system substantially equals the pressure loss in the kiln system, the capacity of said exhaust fan means being so selected relative to the burning ratio of the burners that the velocity of the combustion air introduced into the furnace from the secondary air duct is higher than the flame propagation speed, whereby almost no flame is generated and the finely divided fuel particles which are floating with the finely ground raw material are burnt at a relatively low temperature and without the formation of a high temperature zone in the furnace.

3,869,249
CURING OVEN
Dale George Frische, Belleville, Ill., assignor to Indian Head Inc., New York, N.Y.
Filed Mar. 22, 1974, Ser. No. 453,828
Int. Cl. F27b 9/14
U.S. Cl. 432—121 **7 Claims**



1. An oven for the curing of coated articles such as bottles which comprises a heating section and a cooling section, a segmented continuous duct passing through both these sections and having a coated article conveyor belt extending therethrough, at least one superstructure above the heating section segment of the continuous duct and separated therefrom by a top panel, each superstructure having interconnecting sequential air blower, air diffuser, vent stack and fuel burner chambers, the air blower and fuel burner chambers each being in separate communication with the heating section segment of the continuous duct.

3,869,250
PROCESS FOR THE PRODUCTION OF DIFFERENTIAL EFFECTS ON POLYMERIC OR COPOLYMERIC ACRYLONITRILE FIBERS

Hans Wegmuller, Riehen, and Manfred Motter, Neu-Aesch, Basel-Land, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

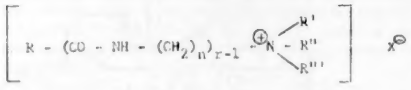
Continuation-in-part of Ser. No. 145,582, May 20, 1971, abandoned. This application June 25, 1973, Ser. No. 373,292

Claims priority, application Switzerland, May 22, 1970, 7573/70

Int. Cl. D06p *5/12*

U.S. Cl. 8—15 **7 Claims**

1. Process for the production of differential effects on copolymeric acrylonitrile fibers, wherein said fibers containing at least 80 percent by weight of acrylonitrile a) are treated at temperatures of at least 85°C with a pH-value of between 3 and 5, with an aqueous perparation consisting essentially of at least one cation active organic ammonium compound of the formula:



wherein

R represents an alkyl radical having 8 to 18 carbon atoms,

R′ and R″ each represent hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, cyano-lower alkyl, cycloalkyl, or a polyalkylene glycol radical, or

R′ and R″ together with the nitrogen atom binding them represent piperidino or morpholino,

R‴ represents hydrogen, lower alkyl, aralkyl, or aralkyl substituted by hydroxyl or lower alkoxy, or

R′, R″ and R ‴ together with the nitrogen atom binding them represent pyridyl or lower alkyl-pyridyl,

r represents 1 or 2,

n represents 2 or 3, and

x represents the anion of an organic or inorganic acid,

and b) said acrylic fibers, treated according to a), are dyed together with untreated material made from said acrylic fibers in a dyebath consisting essentially of an aqueous liquor with at least one cationic dyestuff, wherein the proportion of the dyestuff absorbed by the fibers pretreated according to a) and by the untreated fibers is within 4:96 to 20:80.

3,869,251
APPARATUS FOR INTERMIXING MATERIALS IN A REACTION VESSEL CONTAINING FERROMAGNETIC PARTICLES

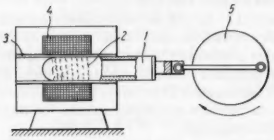
Karl Lazarevich Tsantker, ulitsa Gogolya, 19, kv.4; Dmitry Danilovich Logvinenko, ulitsa Kalinina, 5, kv.5; Oleg Parfirovich Shelyakov, ulitsa Kalinina, 5, kv.100; Vadim Pavlovich Verich, ulitsa Frunze, 106-a, kv.16; Alexandr Vasilievich Skrypnik, Kievskoe shosse, 78, kv.23, all of Poltava, and Nikolai Ivanovich Shishkov, ulitsa Karla Marxa, 22, kv.78, Dnepropetrovsk, all of U.S.S.R.

Continuation of Ser. No. 200,824, Nov. 22, 1971, abandoned. This application May 14, 1973, Ser. No. 359,889

Int. Cl. B01j *1/00*

U.S. Cl. 23—252 R **6 Claims**

1. An apparatus for handling materials comprising: a working vessel adapted to contain the materials being handled; a plurality of ferromagnetic particles located in said working vessel; stationary means embracing the working vessel for generating inside said vessel a rotary electromagnetic field involving said working vessel and said material being handled in order to cause said ferromagnetic particles to rotate and reciprocate and to retain said particles in the effective region of the magnetic field; and means for reciprocating said working vessel along its axis relative to the stationary means for generating said rotary electromagnetic field.



3,869,252
DOSE DISTRIBUTION MEANS

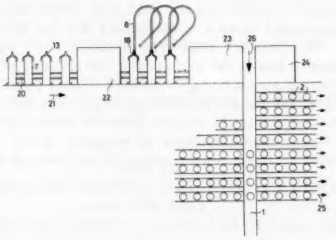
Hans Haug, 7 Stuttghrt 1, Lindpaintnerstr. 56, Stuttgart, Germany

Filed Apr. 20, 1973, Ser. No. 353,111

Claims priority, application Germany, Apr. 22, 1972, 2219862

Int. Cl. G01n *1/14*

U.S. Cl. 23—259 **7 Claims**



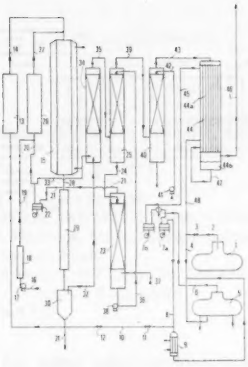
1. Apparatus for the distribution of dosed portions of liquid samples for clinical analysis from the hypodermic syringe used to obtain the same from the patient, said hypodermic syringe having a barrel and a piston located therein, comprising a primary conveyor moving along a predefined path, means for locating said syringe on said primery conveyor, means for coding said syringe, at least one secondary conveyor adapted to contain one or more dose receiving receptacles, said primery conveyor extending in a transverse path over the path of the secondary conveyor, means for indexing said conveyors individually with respect to each other to place a syringe in successive proximity to one or more of said secondary receptacles, a flexible tube connected to the outlet of said syringe to extend into each of the successively adjacent dose receptacles, means for indexing the plunger of said syringe to discharge a predefined portion of said sample from said syringe into selected ones of said dose receptacles, and means for coding said secondary receptacles receiving said dose correspondingly with the syringe.

3,869,253

APPARATUS FOR PRODUCING NITROPARAFFINS

Pierre Lhonore, Douai; Guy Cohen, Paris, and Bernard Jacquinot, Douai, all of France, assignors to Societe Chimique de la Grande paroisse, Azote et produits Chimiques, Paris, France

Division of Ser. No. 299,173, Oct. 19, 1972, Pat. No. 3,780,115. This application Aug. 1, 1973, Ser. No. 384,508
Int. Cl. C07c 79/02; B01j 1/00
U.S. Cl. 23—260 10 Claims



1. An apparatus for the production of nitroparaffins from propane by nitration with nitrogen peroxide in the presence of oxygen introduced in the form of air, comprising:

a reaction vaporizer means for vaporizing nitrogen peroxide;

a combined vaporizer and superheater means connected to said reaction vaporizer means for preheating nitrogen peroxide coming from said reaction vaporizer means together with compressed air to a predetermined temperature;

preheater means for heating compressed propane to a predetermined temperature;

reactor means, connected to said combined vaporizer and superheater means and said preheater means, for receiving the preheated nitrogen peroxide, air and propane and in which takes place the nitration reaction;

rapid cooler means connected to said reactor means, for cooling the effluent from said reactor means;

separator means connected to said cooler means for separating liquid nitroparaffins from the remaining gaseous effluents from said cooler means;

concentrated nitric acid scrubbing column means connected to said separator means for circulating concentrated nitric acid counter-currently with the gaseous effluents from said separator means; and

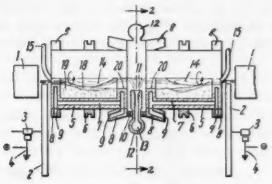
degasifying means, connected to said scrubbing column means, for denitrating the nitric acid used in said scrubbing column means by degasification with compressed air, said nitric acid circulating in closed circuit between said scrubbing column means and said degasifying means.

3,869,254

APPARATUS FOR CARRYING OUT HIGH TEMPERATURE REACTIONS

Tibor Kugler, Sins, Switzerland, assignor to Lonza, Ltd., Gampel, Valais, Switzerland

Division of Ser. No. 68,628, Sept. 1, 1970, Pat. No. 3,705,006. This application Oct. 12, 1972, Ser. No. 299,876
Int. Cl. B01j 1/00; C01g 1/00
U.S. Cl. 23—262 3 Claims



1. A device for carrying out endothermic high temperature reactions, comprising

a horizontally disposed elongated, cylindrical reaction vessel,

said vessel comprising two horizontally disposed, rotary, coaxial chambers and a stationary chamber connected between said rotary chambers,

driving means connected to said rotary chambers for rotation thereof,

said reaction vessel having opposite end walls with openings therein,

means for feeding reactant material substantially coaxial in opposite directions through the openings in the end walls of said vessel into said rotary chambers,

means connected adjacent said end walls for producing two plasma jets and directing them coaxially in opposite directions through the openings in the end walls of said vessel into said rotary chambers,

two coaxial annular baffles on said rotary chambers each forming a boundary between said stationary chamber and one of said rotary chambers,

annular means connected in said stationary chamber coaxial to and spaced from said baffles and provided with an annular central gap,

inlet means in said stationary chamber between said annular means and said baffles for feeding a medium into said stationary chamber, and

said annular means including an annular collector channel communicating with said annular central gap at the outer circumference thereof and having an outlet therein for reaction products.

3,869,255

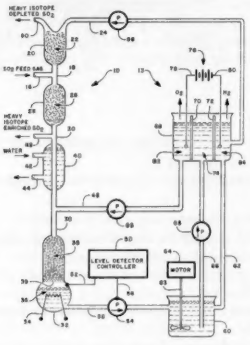
CLOSED LOOP REFLUX SYSTEM

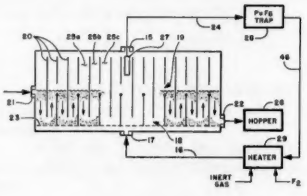
Robert De Witt, Centerville; Bernhart E. Jepson, Dayton, and Roger A. Schwind, Centerville, all of Ohio, assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 10, 1973, Ser. No. 322,566
Int. Cl. B01d 3/00, 59/12; C01b 17/48
U.S. Cl. 23—263 5 Claims

1. Apparatus adapted to separation of different isotopes of sulfur contained in a feed fluid wherein the chemicals used for the separation process are reacted with said feed fluid, regenerated and reused, comprising; a reaction vessel, a distillation vessel, output means on said reaction vessel for removing heavy isotope depleted fluid, initial conduit means for transferring reacted fluid from said reaction vessel to said distillation vessel, condensing means adjacent said initial conduit and said distillation vessel for condensing fluid from said distilla-

tion vessel in said initial conduit means, input means disposed on said reaction vessel for feeding one of said chemicals into said reaction vessel, first input means on said initial conduit for feeding said feed fluid into said initial conduit means, second input means disposed after said condenser and on said initial conduit for feeding another of said chemicals into said initial conduit means; output means for removing isotope enriched fluid disposed between said first input means and said condenser on said initial conduit means; a mixing vessel, means for transferring fluid interconnecting said distillation vessel and said mixing vessel; electrodialysis apparatus including a container, an anion permeable membrane and a cation permeable membrane disposed within said container and dividing said container into at least three compartments, a





cathode disposed within a first of said at least three compartments, an anode disposed within a second of said at least three compartments, a power source electrically interconnecting said anode and said cathode; conduit means disposed on a third of said at least three compartments for transferring materials from said mixing vessel to said third compartment, said third compartment being adjacent said first and said second compartments, conduit means for transferring material from said first compartment to said mixing vessel, said input means interconnecting said first compartment and said reaction vessel for transferring said one of said chemicals from said first compartment to said reaction vessel, and said second input means interconnecting said second compartment and said initial conduit for transferring said another of said chemicals from said second compartment to said initial conduit.

3,869,256

CONTINUOUS FLUID BED REACTOR FOR FISSIONABLE MATERIAL

Donald L. Ziegler, Arvada, Colo., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 28, 1972, Ser. No. 293,177

Int. Cl. B01j *1/00;* **C01g** *56/00*

U.S. Cl. 23—284 **1 Claim**

1. A fluidized bed reactor system for continuously purifying plutonium feed materials and producing plutonium hexafluoride while maintaining a criticality safe condition at all times comprising:

a. a generally horizontally disposed elongated vessel having an inlet port for solid particulate plutonium feed material at one end and an outlet port at a distal and lower end for removal of unreacted particulate feed material, said vessel having a closed top and closed bottom and including
   i. a lower reaction portion with generally parallel side walls, said lower reaction portion having a criticality safe essentially rectangular cross section of not greater than about 19.6 square inches taken in end view; and
   ii. an upper recovery portion communicating with said reaction portion and of greater width and volume than said reaction portion having oppositely disposed side walls diverging outwardly from the parallel side walls of said reaction vessel;
b. distributor plate means within said vessel located beneath said reaction portion for feeding fluidizing fluorine gas and an inert carrier gas;
c. means for removing plutonium hexafluoride gas from said recovery portion;
d. a first plurality of spaced apart baffles disposed within said vessel and having upper and lower edges and spaced from said distribution plate means and said vessel top; and
e. a second plurality of spaced apart baffles intermediate said first plurality of baffles having upper and lower edges and disposed within said vessel, said second plurality of baffles having their lower edges in contact with said distribution plate and said upper edges spaced from the top of said vessel, and each of said second plurality of baffles having an aperture adjacent the juncture of said divergent side walls of said recovery portion with said parallel side walls of said reaction portion to form a continuous passageway for passage of solid particulate feed material in a generally serpentine fashion through the vessel from said inlet port to said outlet port.

3,869,257

PRODUCTION OF NICKEL SULFATE

Heinz Paul Beutner, Englewood, Colo., and George Feick, Needham, Mass., assignors to The International Nickel Company, Inc., New York, N.Y.

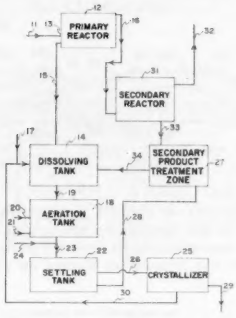
Filed Aug. 17, 1972, Ser. No. 281,486

Int. Cl. C01b *17/96;* **C01g** *53/02, 53/10*

U.S. Cl. 423—544 **8 Claims**

7. A process for the continuous production of nickel sulfate from nickel carbonyl comprising continuously reacting together nickel carbonyl, sulfur dioxide and oxygen at a temperature of about 80° to 150°C to provide solid reaction products consisting essentially of nickel sulfate, nickel sulfite and nickel oxide and gaseous reaction products, dissolving soluble solid reaction products in water to provide an aqueous solution of said soluble solid reaction products, treating solid reaction products insoluble in water in the presence of said aqueous solution of said soluble solid reaction products by aerating the solution, then acidifying the solution with sulfuric acid to maximize the nickel sulfate content of said aqueous solution,

recovering nickel sulfate from said aqueous solution, recovering carbon monoxide from said gaseous reaction products and



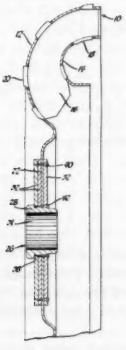
recycling said recovered carbon monoxide to form nickel carbonyl.

3,869,258

FLUID UNIT ROTOR AND METHOD OF MANUFACTURE

William B. Scott, Plymouth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 5, 1972, Ser. No. 286,159
Int. Cl. B23p *15/04*
U.S. Cl. 29—156.8 FC **3 Claims**



1. A method of making a torque transmitting rotor of a hydrodynamic unit for a power transmission comprising the steps of stamping sheet metal stock to simultaneously produce backing ring means for transmission disc clutches and circular disc means formed by the stamped centers of said backing ring means, providing a tubular rotor hub with an enlarged curved head portion and a reduced diameter cylindrical shank portion, forming a central opening with axially extending internal splines in said hub, making an enlarged annular opening in the center of each of said disc means with a diameter sufficiently large to permit a slip fit of said disc means onto said cylindrical shank portion of said rotor hub, making an annular rotor shell with a central flange portion, forming an annular opening in the center of said flange portion with a diameter sufficiently large to permit a slip fit of said rotor shell onto said cylindrical shank portion, inserting said rotor hub into the opening of first of said disc means so that said shank portion extends through the central opening in said first disc means and said head portion abuts against one side of said first disc means, loading said rotor shell on said hub member so that said shank portion extends through said central opening of said flange portion and so that said flange portion of said rotor shell contacts the adjacent surface of said first disc means, loading second disc means on said hub member so that said shank portion extends through the annular opening therein and said second disc means contacts the adjacent surface of said flange portion of said rotor shell, staking said disc means and said flange portion in an interleaved position on said shank portion of said hub, electron beam welding said disc means and said flange portion to each other with a first circular electron beam weld focused at a predetermined depth and extending through all of said disc means, and utilizing the same focal depth as said first weld to electron beam weld said disc means and said flange portion to each other and to said shank portion by a second circular electron beam weld which has a diameter smaller than said first circular electron beam weld and which extends to said head portion through all of said disc means.

3,869,259

COMPOSITE SLIDING MEMBER

David M. Lindsey, Taylor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1973, Ser. No. 356,611
Int. Cl. C22c *1/04*
U.S. Cl. 29—182.8 **4 Claims**

1. A liquid phase sintered metal-carbon composite sliding member formed of carbon uniformly dispersed in and metallurgically bonded to a phase of a copper base alloy, said copper base alloy consisting essentially, by weight, of 5% to 20% titanium, 3% to 22% lead, 0% to 15% tin and the balance copper, said carbon making up about 20% to 80% by volume of said composite member, said metallurgical bond comprising titanium carbide.

3,869,260

MANUFACTURE OF SUPPORTS FOR USE WITH SEMICONDUCTOR DEVICES

Sydney Jackson, Chadderton, and Joseph Bell Titterington, Worsthorn Burnley, both of England, assignors to Ferranti, Limited, Hollinwood, England

Division of Ser. No. 262,176, June 13, 1972, Pat. No. 3,771,212, which is a continuation of Ser. No. 27,478, April 13, 1970, abandoned. This application May 14, 1973, Ser. No. 359,872
Int. Cl. B32b *15/04*
U.S. Cl. 29—195 **12 Claims**

1. An article of manufacture comprising a metal supporting member, a semiconductor device, means for bonding said semiconductor device to said supporting member, said means including at least one metallic particle of bonding material, a bonding joint between the semiconductor device and a selected part of the surface of the supporting member, said selected part of the surface being recessed to receive the particle, said recess being formed upon impaction of the particle into the surface of the supporting member by an impaction tool.

3,869,261

CORROSION-RESISTANT COMPOSITE COATING TO BE FORMED ON STEEL MATERIALS AND METHOD OF FORMING THE SAME

Kunio Katsuma, Tokyo, Japan, assignor to USUI Kokusai Sangyo Kabushiki Kaisha, Sunto-gun, Shizuoka Prefecture, Japan

Filed May 22, 1974, Ser. No. 472,132
Int. Cl. B23p *3/20*; **C23b** *5/50*, *5/52*
U.S. Cl. 29—196.3 **4 Claims**

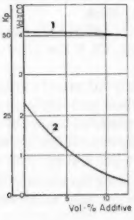
1. An article comprising a steel base and a corrosion-resistant coating thereon, said coating having been obtained by forming a three-layer structure on the steel material surface, said structure consisting of a zinc electroplating inner layer, a copper electroplating intermediate layer and then a tin electroplating outer layer, and forming a copper-tin alloy layer between the intermediate and outer layers through heat treatment of said three-layer structure.

3,869,262

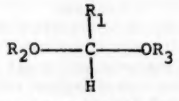
FUEL AND ADDITIVE FOR THE PRODUCTION THEREOF

Herbert Mayerhoffer; Wilhelm Schneider; Hardo Nuring, and Wolfgang Exner, all of Wien, Austria, assignors to Oesterreichische Hiag-Werke Aktiengesellschaft, Vienna, Austria

Filed May 5, 1972, Ser. No. 250,548
Claims priority, application Austria, May 5, 1971, 3933/71; Nov. 24, 1971, 10127/71
Int. Cl. C10l *1/18*
U.S. Cl. 44—56 **15 Claims**



1. A fuel for use in internal combustion engines having a substantially constant heating value and providing a reduced amount of carbon monoxide in the exhaust gases of the engine comprising gasoline containing from 0.2 to 12 volume % of an additive comprising at least one oxygen-containing compound of the general formula (I)



(I)

wherein R_1 is H or CH_3 and R_2 and R_3 are each CH_3, C_2H_5, C_3H_7 or C_4H_9.

3,869,263

ABRASIVE MEMBER

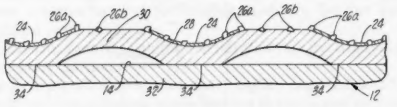
Harold Jack Greenspan, 5334 Holt Ave., Los Angeles, Calif. 90056

Filed Sept. 14, 1973, Ser. No. 397,371
Int. Cl. B24d *3/08*, *7/18*
U.S. Cl. 51—209 R **4 Claims**

2. An abrasive member comprising:

a. a rigid support member;

b. a working surface on said support member provided with a multiplicity of interspaced convex protuberances and concave depressions blended together so as to form smoothly rounded peaks and valleys extending over substantially the entire working surface, said working surface comprising a metal sheet material affixed to said support member, said support member providing a substantially continuous planar surface for supportable contact with said metal sheet; and



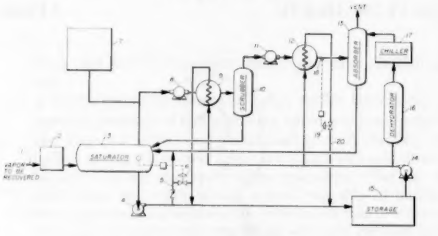
c. a multiplicity of abrasive particles fixedly positioned relative to said working surface so that at least portions thereof extend outwardly from the surfaces of the protuberances and depressions formed on said working surface.

3,869,264

VAPOR RECOVERY METHOD AND SYSTEM

George W. Richards, Tulsa, Okla., assignor to Combustion Engineering, Inc., New York, N.Y.

Filed Mar. 7, 1974, Ser. No. 449,124
Int. Cl. B01d *47/00*
U.S. Cl. 55—88 **9 Claims**



1. A method of liquefying vapors released when volatile liquid is transferred between containers, including,

collecting a mixture of the released vapors and air,

saturating the collected vapor mixture with the volatile liquid,

compressing the saturated vapor mixture a first time,

cooling the compressed vapor mixture with volatile liquid from a stored quantity of the liquid,

removing liquids condensed by the cooling of the compressed vapor mixture,

compressing the saturated vapor mixture a second time,

cooling the compressed vapor mixture with volatile liquid from a stored quantity of the liquid,

dehydrating a stream of volatile liquid from the stored quantity,

refrigerating the dehydrated stream,

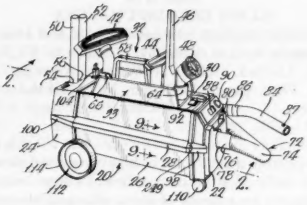
contacting the compressed, saturated vapor mixture with the refrigerated and dehydrated stream of volatile liquid whereby vapors released by transfer are absorbed by the liquid,

and collecting the volatile liquid which absorbed the released vapors and using the liquid to saturate the collected vapor mixture.

3,869,265
CANISTER TYPE VACUUM CLEANER

Gilbert R. Wolter, Elmhurst; Eugene B. Szymczak, Chicago, and Elmer Eugene Bruning, Normal, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed July 10, 1972, Ser. No. 270,421
Int. Cl. B01d *46/02*
U.S. Cl. 55—274 **10 Claims**



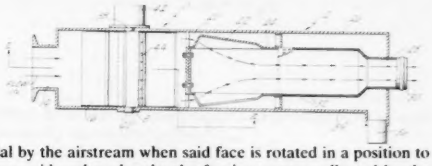
3. A canister-type vacuum cleaner comprising an elongated tank, a front cap closing off the front end of said tank and having an inlet aperture for receiving an inlet hose and hose release means for releasably securing said hose in said inlet aperture, means hingedly mounting said front cap on said tank whereby said front cap may be pivotally swung open when a new dust bag is to be inserted into the vacuum cleaner, latch means for securing said front cap over the front end of said tank during operation of the vacuum cleaner, a rear cap closing off the rear end of said tank, and having air outlet means, a dust bag holder mounted in the forward end of said tank, an electric motor mounted in said tank to the rear of said dust bag holder, a power cord for supplying electrical power to said motor, suction-producing means in said tank and adapted to be driven by said motor, means secured to said vacuum cleaner for providing for movability of said vacuum cleaner while it is in contact with the floor, said tank being formed of an upper shell and a lower shell, said upper and lower shells having respectively a pair of integrally formed lower flanges and a pair of integrally formed upper flanges which run for substantially the length of said tank in the direction of the elongated dimension of said tank, each of said upper flanges extending substantially horizontally outwardly on opposite sides of said tank in abutting relationship with one of said lower flanges, which also extend substantially horizontally outwardly on opposite sides of said tank, the outer edges of said upper and lower flanges being bent downwardly and upwardly, respectively, and a pair of elongated removable resilient bumpers, each of said bumpers being recessed in a manner to receive one set of abutting upper and lower flanges including the bent edges thereof whereby said bumpers are mounted on and substantially cover said flanges along substantially the length thereof.

3,869,266
SELF-CLEANING COALESCER

George C. Rannenberg, Canton, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 26, 1974, Ser. No. 464,710
Int. Cl. B01d *46/40*
U.S. Cl. 55—309 **5 Claims**

1. A coalescer in combination with a water separator for aircraft air cycle airconditioning system which air contains foreign matter, a casing having an inlet and outlet, water separating means for centrifuging the heavy particles in the airstream out of the airstream in said casing, said coalescer in said casing between said inlet and outlet and upstream of said water separating means, said coalescer having coalescing material extending radially from an axis disposed transverse to said outlet in said casing and substantially continuously rotated about said axis so that the air flow from said inlet passes through said coalescing material depositing said foreign matter on the face of said coalescer material when facing said inlet before being admitted into said water separating means and said foreign matter being picked up from said coalescer mate-

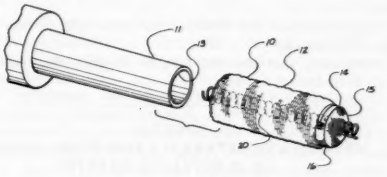


rial by the airstream when said face is rotated in a position to face said outlet whereby the foreign matter collected by the coalescer material is blown-off and discharged into the water separating means and separated out from said airstream thereby.

3,869,267
EXHAUST GAS FILTER

Josephine Gaylor, 203 Almenter, Rock Hill, Mo. 63119

Filed Sept. 4, 1973, Ser. No. 394,173
Int. Cl. B01d *39/06*
U.S. Cl. 55—492 **4 Claims**



1. A gas filter for an exhaust pipe comprising:

a. a body of fibrous filter material having a non-rigid periphery adapted to be received in the exhaust pipe,

b. a base member at one end of said body including a screen and an exhaust pipe mounting means, and

c. an elongate core member within said body attached to said base member in cantilever relation and extending substantially the length of said body to support said fibrous material and substantially expose the transverse area of the other end of said body to permit substantially unimpeded longitudinal flow of gas through the fibrous material.

3,869,268
METHOD AND APPARATUS FOR CHOPPING FIBERS

Thomas J. Briar, Trafford, and William L. Schaefer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 11, 1973, Ser. No. 423,838
Int. Cl. C03b *37/02*
U.S. Cl. 65—2 **15 Claims**

1. A method of preparing particulate glass fiber strand comprising:

forming a plurality of continuous glass filaments from a glass fiber bushing;

applying a size to said filaments;

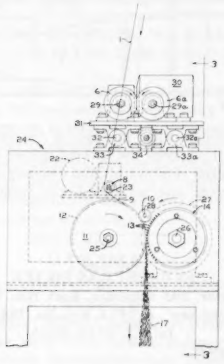
consolidating said filaments into one or more continuous glass fiber strands;

passing said strand or strands into an attenuation zone, attenuating said strand or strands and the filaments associated therewith in said zone;

passing the strand or strands from said attenuation zone to a cutting zone;

feeding said strand or strands between cutting blades and a resilient surface capable of being depressed by said cutting blades, to thereby cut said continuous strand or strands into discrete lengths;

controlling the vibration of the cutting blades while cutting said strand into discrete lengths by holding said blades in a mounting maintained between 0.002 to 0.004 inch



greater than the width of the mounting section of said blades; and

collecting said discrete lengths of glass fiber strand so formed.

3,869,269

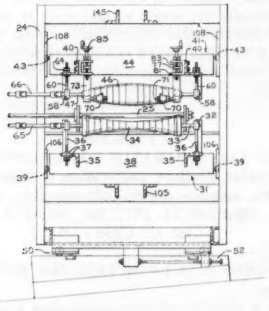
METHOD AND APPARATUS FOR PRESS SHAPING HEAT-SOFTENED SHEETS

Isaac D. Knapp, Galion, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 20, 1973, Ser. No. 371,910

Int. Cl. C03c *23/02*

U.S. Cl. 65—106 **21 Claims**



1. Apparatus for shaping a deformable sheet by roll forming while continuously moving the latter through said shaping apparatus comprising

an upper set of rotatable shaping rolls,

a lower set of rotatable shaping rolls,

each shaping roll of one set having a longitudinally extending surface, each shaping roll of the other set having a longitudinally extending surface and each shaping roll of said one set having a shape complementary to a corresponding shaping roll of said other set, the longitudinally extending surface of at least one of said shaping rolls having a portion thereof which approaches the central longitudinal axis of that roll to provide a wide space between said portion of that roll and a corresponding portion of an adjacent roll of its set,

supporting means for mounting auxiliary roller means in said wide space in a position to contact a portion of said deformable sheet conveyed through said shaping apparatus, and

auxiliary roller means mounted on said supporting means.

3,869,270

GLASS COLOUR CHANGES

Michael Brungs, Concord, New South Wales, and John Burniston, Highgate, both of Australia, assignors to A.C.I. Operations Pty. Limited, Melbourne, Victoria, Australia

Filed Aug. 7, 1973, Ser. No. 386,446

Int. Cl. C03b *5/16*

U.S. Cl. 65—134 **4 Claims**

1. A method of reducing foam formation in a furnace during a changeover from a glass melt of highly oxidized state of one colour to a reduced state of a different colour which comprises gradually, by a series of steps, changing the oxidation state by adding reducing substance to the batch until the melt is on the verge of colour instability and then introducing sufficient colourants and reducing substances to produce a stable reduced state.

3. A method of reducing foam formation in a furnace during a changeover from a glass melt of highly reduced state of one colour to an oxidized state of a different colour which comprises gradually, by a series of steps, changing the oxidation state by removing reducing substances from the batch until the melt is on the verge of colour instability and then removing colourant and sufficient reducing substances to produce a stable oxidized state.

3,869,271

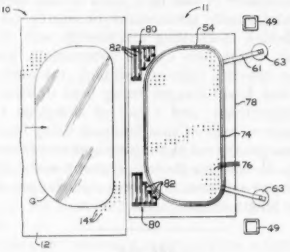
SHAPING GLASS SHEETS

Paul D. Shaffer, Tyrone; Vaughn R. Imler, Claysburg, and Jack D. Morrissey, Tyrone, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 26, 1973, Ser. No. 383,021

Int. Cl. C03b *23/02*

U.S. Cl. 65—273 **12 Claims**



1. In an apparatus for conveying and shaping glass sheets along a horizontal path of movement, comprising

an elongated heating furnace and a shaping station disposed in end-to-end relation,

an outline shaping ring mold disposed in said shaping station,

a first porous bed within said heating furnace providing gas for supporting glass sheets in floating relation thereover during movement therethrough,

a second porous bed within said shaping ring mold providing gas for supporting one of said glass sheets at a time in floating relation thereover, said shaping ring mold having a trailing longitudinal edge and a leading longitudinal edge, at least one terminal portion of said trailing longitudinal edge being disposed so that a substantial space

exists between said portion of said trailing edge and said first porous bed, and

roller means rotatably supported in said space so as to contact and support a portion of the glass sheet that sags below its horizontal path of movement.

3,869,272

MANGANESE MICRONUTRIENT

Richard J. Windgasen, East Chicago, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 222,374, Jan. 31, 1972, abandoned. This application Sept. 19, 1973, Ser. No. 398,656

Int. Cl. C05f *11/00*; **C05d** *9/02*

U.S. Cl. 71—1 **5 Claims**

1. An aqueous ammoniacal divalent manganese plant nutrient solution, said solution containing from about 3 to about 8 weight percent soluble divalent manganese metal and having a pH of from about 9 to about 12, said solutin consisting of (A) an amount of a divalent manganese-affording compound soluble in said solution sufficient to provide said amount of manganese metal, (B) at least one mol of citric acid anion per mol of divalent manganese metal, (C) from about 0.01 to about 5 weight percent sodium bisulfite, (D) an amount of ammonia sufficient to provide said solution pH, and (E) water.

3,869,273

COMPOSITIONS AND METHOD FOR ALTERING PLANT GROWTH WITH AN ALKYLENEBISDITHIOCARBAMATIC COMPLEX

Robert L. Noveroske, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 138,751, April 29, 1971, Pat. No. 3,755,394, which is a continuation-in-part of Ser. No. 39,899, May 22, 1970, abandoned. This application Apr. 20, 1973, Ser. No. 353,196

Int. Cl. A01n *21/02*, *9/00*

U.S. Cl. 71—77 **13 Claims**

1. A method comprising contacting plants, plant parts and their habitats with a plant growth-altering amount of a metallic zinc-containing alkylenebisdithiocarbamate:ethylenepolyamine complex compound wherein the metal is from 30 to 100 mole percent zinc and from 70 to 0 mole percent of additional metal consisting of one or more of manganese, nickel, iron, cobalt or copper; the ethylene polyamine corresponds to one or more compounds of the formula

$NH_2—(CH_2CH_2NH)_n—H$

in which *n* represents an integer from one to five, inclusive; and the molar ratio of zinc to the polyethylenepolyamine is from 8:1 to 3:1, inclusive.

3,869,274

METHOD AND COMPOSITION FOR INDUCING FRUIT ABSCISSION

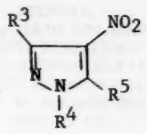
Aldo Joseph Crovetti, Lake Forest; Donald Sykes Kenney, Northbrook; Don Murl Lynch, Waukegan, and Robert George Stein, Kenosha, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 21, 1972, Ser. No. 282,889

Int. Cl. A0ln *9/22*

U.S. Cl. 71—92 **6 Claims**

1. A method of inducing the abscission of fruit from fruit-bearing plants comprising the step of treating plants bearing substantially mature fruit with a composition comprising an effective amount of a compound having a formula



where R^5 is halo, R^4 is hydrogen, and R^3 is alkyl, in an agronomically acceptable carrier.

3,869,275

HERBICIDAL MIXTURES

Friedrich Arndt, Aich, and Gerhard Boroschewski, Berlin, both of Germany, assignors to Schering AG, Berlin and Bergkamen, Germany

Continuation of Ser. No. 95,410, Dec. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 760,692, Sept. 18, 1969, abandoned. This application Feb. 26, 1973, Ser. No. 335,704

Int. Cl. A01n *9/22*

U.S. Cl. 71—92 **3 Claims**

1. A process for the selective control of weeds without substantial damage to crop plants which comprises the post-emergence application of a herbicidal composition consisting essentially of herbicidally effective amounts of 3-cyclohexyl-5,6-trimethylene uracil and a carbamate selected from the group consisting of methyl-N-(3-N'-(3'-methylphenyl)-carbamoyloxy)-phenyl)carbamate, methyl-N-(3-N'-phenylcarbamoyloxy-phenyl)-carbamate, ethyl-N-(3N'-(3'-methylphenyl)-carbamoyloxy)-phenyl)-carbamate, and methyl N-(3-N'-(3'-, 5'-dimethylphenyl)-carbamoyloxy)-phenyl)-carbamate, the ratio of the weight of said uracil to the carbamate being about 1:1.

3,869,276

NOVEL INDUSTRIAL WEED CONTROL COMPOSITIONS

Michael A. Priola, Briarcliff Manor, N.Y., and Ernest C. Carver, Hazlet, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 1, 1972, Ser. No. 249,033

Int. Cl. A01n *9/22*

U.S. Cl. 71—93 **21 Claims**

1. A liquid herbicidal formulation consisting essentially of (a) about 8–20 percent by weight pentachlorophenol, (b) about 20–40 percent by weight 2,4-bis(isopropylamino)-6-methoxy-s-triazine, and (c) about 20–40 percent by weight of a non-water soluble surfactant, in admixture with a dipolar, aprotic, organic solvent.

3,869,277

HERBICIDAL COMPOSITION AND METHODS

Julius Berger; David Pruess, both of Passaic, and James Parnell Scannell, Bloomfield, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed May 16, 1973, Ser. No. 361,013

Int. Cl. A01n *9/20*

U.S. Cl. 71—113 **2 Claims**

1. A method of controlling undesirable plants by postemergent treatment which comprises applying to said plants a herbicidally effective amount of a composition comprising a herbicidal adjunct and, as the active ingredient, a herbicidally effective amount of a compound selected from the group consisting of L-trans-2-amino-4-(2-aminoethoxy)-3-butenoic acid and acid addition salts thereof.

3,869,278

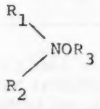
HYDROXYLAMINES AND DERIVATIVES THEREOF AS ABSCISSION AGENTS

Merrill Wilcox, 2911 N.W. 30th Ter., Gainesville, Fla. 32601

Continuation-in-part of Ser. No. 275,657, July 27, 1972, abandoned. This application Jan. 24, 1974, Ser. No. 436,312
Int. Cl. A01n

U.S. Cl. 71—121 7 Claims

1. A method of aiding in the harvesting of fruit wherein abscission is included, which method comprises applying to the fruit bearing plant an effective amount of a compound of the formula:



wherein R_1 and R_2 represent independently hydrogen, C_1 –C_6 alkyl radicals; and R_3 represents hydrogen, C_1 –C_6 alkyl, alkylcarbonyl, N-alkylcarbamoyl, N,N-dialkylcarbamoyl, phenylcarbonyl or phenylcarbamoyl; the alkyl substitution on the R_3 groups containing from 1–6 carbon atoms; or the acid, alkali and alkaline-earth metal salts thereof.

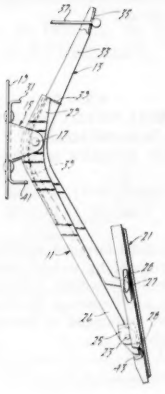
3,869,279

ACCELERATOR PEDAL ASSEMBLY

Delmar C. Grimes, Flint, and Raymond Stocker, Bloomfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,821
Int. Cl. G05g 1/14

U.S. Cl. 74—513 7 Claims



1. A pedal assembly suitable for use as an accelerator for an automotive vehicle, said pedal assembly comprising:

a first lever,

a second lever,

mounting means secured to the body of the automotive vehicle or the like,

said first and second levers being attached to said mounting means to pivot about a common axis,

said first lever being pivotable relative to said second lever, a pedal pad pivotally attached to one end of said first lever,

said second lever being connected at one end to motion transfer means to connect the pedal assembly and remote element,

said second lever at its other end slidably engaging the pedal pad.

3,869,280

PROCESS FOR GOLD PRECIPITATION

Darwin James Langlois, Lewiston, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 23, 1973, Ser. No. 353,913
Int. Cl. C22b 11/04

U.S. Cl. 75—.5 A 4 Claims

1. In a process for preparing finely divided gold powder by reductive precipitation of gold from an aqueous solution of gold chloride, the improvement of adding to the aqueous solution of an amount of polyvinyl alcohol effective to reduce agglomeration of the gold precipitate, whereby a substantially nonagglomerated fine gold powder of reduced bulk density is produced, which is fireable over a wide temperature range to films of enhanced brightness and continuity.

3,869,281

REMOVAL OF NICKEL FROM MOLTEN MAGNESIUM METAL

George S. Foerster, Monmouth Jct., N.J., assignor to N L Industries, Inc., New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,367
Int. Cl. C22b 45/00

U.S. Cl. 75—67 2 Claims

1. A process for removing nickel metal from magnesium metal, in which the nickel content is present in amount up to about 0.2%, which comprises adding zirconium metal and aluminum metal to said magnesium metal to form a ternary phase Zr-Al-Ni which is insoluble in said magnesium metal, and separating the ternary phase from the resultant purified magnesium metal.

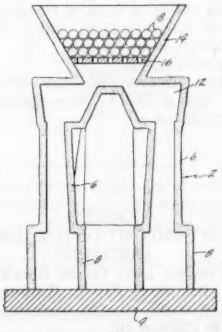
3,869,282

METHOD OF CLEANING NICKEL ALLOY BY FILTERING

Patrick M. Curran, Center Rd., Tolland, Conn. 06084; Geoffrey R. Brazer, 1404 McClelland, Salt Lake City, Utah 84105, and John S. Erickson, RFD No. 1, Waterhole Rd., Colchester, Conn. 06415

Division of Ser. No. 291,126, Sept. 21, 1972, Pat. No. 3,815,661. This application Mar. 20, 1974, Ser. No. 452,856
Int. Cl. C22c 1/00

U.S. Cl. 75—82 2 Claims



1. The process of cleaning a molten nickel base alloy containing a dross said alloy including as an essential element a metal subject to oxidation during preparation of the molten alloy and said dross comprising an oxide of said metal, by removing the dross from the alloy, said removal comprising the steps of heating a ceramic filter consisting of a bed of a

plurality of substantially spherical ceramic particles made of an oxide, said bed having more than one layer of said ceramic particles in contact with one another, and pouring the molten alloy containing dross through said filter whereby metal oxides of the dross are caused to adhere to the particles and be retained thereby, and recovering substantially dross free alloy.

3,869,283
ALLOYING STEELS

Emrys Davies, Brymbo, near Wrexham, Wales, and John Roy Rippon, Sheffield, England, assignors to British Steel Corporation, London, England

Continuation of Ser. No. 80,553, Oct. 14, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,451

Claims priority, application Great Britain, Oct. 15, 1969, 50609/69

Int. Cl. C22c *33/00*

U.S. Cl. 75—129 **16 Claims**

1. A method of adding an alloying addition to a particular steel, the method comprising the steps of heating the steel in a furnace to a temperature substantially above that at which said particular steel is normally heated for tapping into a ladle for teeming into ingot molds, tapping the steel from the furnace into a ladle while it is at a temperature substantially above that at which it is customarily tapped from the furnace for teeming into ingot molds, passing gas through the steel in the ladle, the passage of gas being such that turbulence is created in the steel and a turbulent zone is created at the surface thereof, simultaneously adding said alloying addition to the steel in the region of said turbulent zone while said steel is at a temperature sufficient to ensure solution of said alloying addition, removing any toxic fumes generated by the alloying addition, continuing to pass gas through the steel so as to maintain turbulence therein and permitting the steel to cool until the temperature thereof reaches the customary teeming temperature for said particular steel, and teeming the steel into molds.

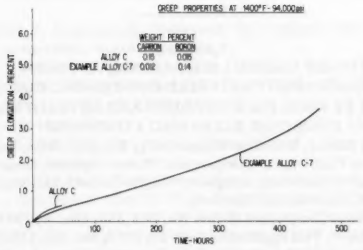
3,869,284
HIGH TEMPERATURE ALLOYS

James French Baldwin, 220 Mac Farlane, Delray Beach, Fla. 33444

Filed Apr. 2, 1973, Ser. No. 346,815

Int. Cl. C22c *19/00*

U.S. Cl. 75—134 F **53 Claims**



1. A nickel base alloy for use at relatively high temperatures consisting essentially of the following elements in the weight percent ranges set forth:

Elements	Percent
Chromium	5–22
Aluminum	0.2–8
Titanium	0.5–7
Boron	0.07–0.25
Carbon	less than 0.05%
Cobalt	0.00–20
Columbium	0.00–3
Molybdenum	0.00–8
Tantalum	0.00–10
Vanadium	0.00–2
Tungsten	0.00–20
Rhenium	0.00–2
Zirconium	0.00–1.00.

the balance of the alloy being essentially nickel and minor amounts of impurities and incidental elements which do not detrimentally affect the basic characteristics of the alloy, said nickel being present in an amount of from about 35% to 85% by weight.

3,869,285
PLATE-MAKING MASTER AND METHOD FOR PRODUCING A PRINTING PLATE WHICH DOES NOT REQUIRE DAMPENING WATER

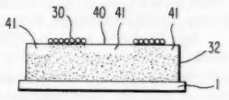
Asaji Kondo; Shinzo Kishimoto; Kenichiro Yazawa; Shizuo Miyano, and Satoru Honjo, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-shi, Kanagawa, Japan

Filed May 15, 1973, Ser. No. 360,511

Claims priority, application Japan, May 15, 1972, 47-47977

Int. Cl. G03g ; G03f *7/02*

U.S. Cl. 96—1 R **14 Claims**



1. A method for producing a printing plate that does not require dampening water during printing, which comprises electrostatically charging a plate-making master, said master comprising a support and a photosensitive layer formed thereon consisting essentially of a mixture of a photoconductive substance and a silicone rubber in a ratio of 6-0.1:1, uniformly in a dark place, exposing it through an original, developing it with a toner, fixing the toner by heating thereby to form on said master an ink receptive portion having the toner adhered thereto and an ink repelling portion free from the toner, and then treating the resulting plate with an acid to thereby dissolve the photoconductive substance at the portion free from the toner.

3,869,286
PHOTOELECTROPHORETIC IMAGING WITH COPPER-REE CHLOROPHYLL IN THE CARRIER LIQUID

John B. Wells, Savannah, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1973, Ser. No. 425,015

Int. Cl. G03g *13/22*

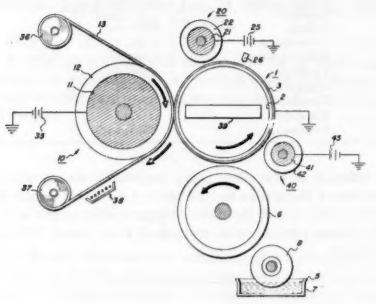
U.S. Cl. 96—1 PE **7 Claims**

1. A method of imaging which comprises:

a. providing a layer of a suspension of electrically photosensitive particles in an insulating carrier liquid on a first electrode, said imaging suspension also containing copper-free chlorophyll;

b. exposing said suspension to a pattern of electromagnetic

radiation to which at least a portion of said particles are responsive, and



c. applying an electrical field across said suspension until an image is formed.

3,869,287

COLOR PHOTOGRAPHIC MATERIALS

Tadao Sakai; Nobuo Yamamoto; Masakazu Yoneyama; Masao Sawahara, and Takeshi Hirose, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 15, 1973, Ser. No. 360,507

Claims priority, application Japan, May 16, 1972, 47-48451

Int. Cl. G03c *7/16, 5/52, 7/24*

U.S. Cl. 96—22 **10 Claims**

1. A color photographic material comprising a support having thereon at least one blue-sensitive silver halide emulsion layer containing a yellow dye-forming coupler, at least one red-sensitive emulsion layer containing a cyan dye-forming coupler, at least one green-sensitive emulsion layer containing a magenta dye-forming coupler, and at least one silver halide emulsion layer containing a bleach inhibitor having at least two oxyethylene groups, said silver halide emulsion layer substantially not being capable of forming a dye image for picture recording.

3,869,288

METHOD OF DEVELOPING COLOR FILM

Leopold S. Godowsky, 19 Stony Point Rd., Westport, Conn. 06880

Continuation of Ser. No. 118,515, Feb. 24, 1971, abandoned. This application July 25, 1973, Ser. No. 382,470

Int. Cl. G03c *7/16*

U.S. Cl. 96—22 **8 Claims**

1. The method of developing exposed color film having a photographic emulsion comprising a plurality of layers each containing a silver halide and a different color coupler which comprises subjecting the exposed film emulsion to contact with an inactively-acidic aqueous color developer solution for a sufficient period of time for the developer solution to pervade the emulsion and thus establish a uniform concentration of the developer in and throughout each of said layers, and immediately thereafter effecting permeation of the thus-treated emulsion with a spray of small droplets of a strongly alkaline aqueous solution substantially exclusively by diffusion free from agitation into said emulsion layers and thus rendering substantially the entire content of said developer in each layer reactive with respect to the exposed silver salt and coupler therein.

3,869,289

NOVEL COMPOSITIONS AND PHOTOGRAPHIC PROCESSES

Charles F. Amering, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 104,690, Jan. 7, 1971,. This application Feb. 15, 1973, Ser. No. 332,964

Int. Cl. G03c *5/30*

U.S. Cl. 96—66.3 **10 Claims**

1. A photographic developing composition comprising water, a silver halide developing agent and reaction products of a thioamine which is cysteine, cystine, DL-penicillamine, DL-homocysteinethiolactone or 2-aminoethanethiol with glutaraldehyde or with glutaraldehyde bisulfite in which said reaction products are obtained by reacting a mixture having a molar ratio of from about 4 to 1 to about 1 to 60 of said thioamine to glutaraldehyde or glutaraldehyde bisulfite.

3,869,290

PHOTOGRAPHIC SILVER HALIDE ELEMENTS OF THE LIPPMANN-TYPE

Herman Adelbert Philippaerts, Edegem; Robert Joseph Pollet, Vremde; Antoon Leon Vandenberghe, Hove, and Jozef Frans Willems, Wilrijk, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

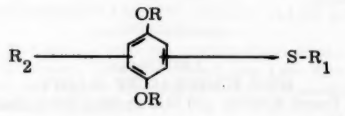
Filed Nov. 3, 1972, Ser. No. 303,403

Claims priority, application Great Britain, Nov. 10, 1971, 52289/71

Int. Cl. G03c *1/34*

U.S. Cl. 96—76 R **5 Claims**

1. Photographic silver halide emulsion including a silver halide and hydrophilic colloid binder, said emulsion being of the Lippmann type having an average grain size of less than 100 nm and comprising from 20 mg to 2 g per mole of silver halide of a compound of the formula:



wherein:

R is hydrogen, acyl, haloacyl or acyl carrying a quaternary ammonium group,

R_1 is an aliphatic, aromatic or heterocyclic group, and

R_2 is hydrogen, the group -S-R_1 or one or more substituents selected from alkyl, aryl, halogen, hydroxyl and alkoxy;

the ratio of silver halide to hydrophilic colloid binder in the emulsion being from 1 : 2 and 4 : 1.

3,869,291

SILVER HALIDE LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL CONTAINING COLOR COUPLER MASKING COMPOUND AND DEVELOPMENT INHIBITOR RELEASING COMPOUND

Helmut Mader, Odenthal-Hahnenberg; Rigobert Otto, Leverkusen; Paul Marx, Cologne, and Walter Puschel, Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 205,282, Dec. 6, 1971, abandoned. This application Nov. 29, 1973, Ser. No. 419,996

Claims priority, application Germany, Dec. 8, 1970, 2060196

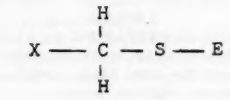
Int. Cl. G03c *1/40*

U.S. Cl. 96—100 **3 Claims**

1. In a light-sensitive color-photographic material comprising at least one light-sensitive silver halide emulsion layer, which layer contains the following compounds:

a. a colorless non-diffusing color coupler I which gives a non-diffusing image dye on reaction with color developer oxidation products;
b. a non-diffusing mask former II which forms, during photographic processing, a color mask suitable for masking the side density of the image dye; said mask former being selected from the group consisting of an osazone, an amidrazone, and a colored masking coupler;
c. a colorless non-diffusing non-preformed DIR-compound III which is a thioether and which splits off a diffusing development-inhibiting substance during reaction with color developer oxidation products;

the improvement according to which the non-preformed DIR-compound III does not contribute towards formation of the image dye during photographic processing and has the formula



in which

E represents aryl or an aromatic heterocyclic group; and
X represents a benzoyl group carrying at least one substituent which contains an alkyl radical with at least 10 carbon atoms.

3,869,292
LIGHT-SENSITIVE COMPOSITIONS AND LIGHT-SENSITIVE MATERIALS SUCH AS PRINTING PLATES

Martinus T. J. Peters, Venlo, Netherlands, assignor to Oce-van der Grinten, N.V., Venlo, Netherlands

Filed May 3, 1973, Ser. No. 357,025
Claims priority, application Great Britain, May 5, 1972, 21191/72
Int. Cl. G03f *7/08;* **G03c** *1/52*
U.S. Cl. 96—115 R **10 Claims**

1. A light-sensitive composition for graphic arts such as for sensitizing printing plates, comprising a mixture of a light-sensitive diazo or azido compound and, per part of said compound, about 0.2 to 20 parts by weight of a vinyl phenol resin produced by normal vinyl polymerization and selected from the group consisting of homopolymers and copolymers of ortho-, meta-, and para-vinyl phenols and wherein, when said resin is a copolymer, the comonomer of the copolymer is another vinyl compound.

3,869,293
INORGANIC COATING COMPOSITIONS AND A METHOD

Robert J. Brumbaugh, Pottstown, Pa., assignor to Teleflex Incorporated, North Wales, Pa.

Continuation-in-part of Ser. No. 169,854, Aug. 6, 1971, abandoned. This application July 23, 1973, Ser. No. 381,642
Int. Cl. C04b *35/04;* **C09d** *1/00*
U.S. Cl. 106—14 **15 Claims**

1. A composition consisting essentially of a dispersion of inorganic solid particulate material in an aqueous solution the solute of which consists essentially of a combination of inorganic compounds selected from the group consisting of phosphoric acid, chromic acid, molybdic acid and the metal salts of said acids, the combination of compounds in said solution being such as will provide at least 1 mol per liter dissolved phosphate, at least 0.3 mol per liter dissolved material selected from the group consisting of chromate and molybdate, and at least 0.5 mol per liter dissolved metal, said solid particulate material being present in an amount of from about 10 to 2000 grams per liter of said solution, at least about 1% by weight of said solid particulate material being an alloy containing at least about 3% by weight aluminum and at least about 0.5% by weight magnesium, and at least about 0.5% of the total weight of said solid particulate material being magnesium alloyed with aluminum, the aluminum and magnesium constituting more than 50% by weight of said alloy, said composition being heat curable upon drying thereof to a substantially water insoluble material with said solid particulate material being bonded therein.

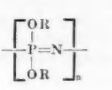
12. An article of manufacture comprising a solid substrate having deposited thereon a layer formed by drying and heat curing to water insolubility a coating consisting essentially of a mixture of powder in an aqueous solution the solute of which consists essentially of a combination of inorganic compounds selected from the group consisting of phosphoric acid, chromic acid, molybdic acid and the metal salts of said acids, the combination of compounds in said solution being such as will provide at least 1 mol per liter dissolved phosphate, at least 0.3 mol per liter dissolved material selected from the group consisting of chromate and molybdate, and at least 0.5 mol per liter dissolved metal, at least about 1% by weight of said powder being an alloy containing at least about 3% by weight aluminum and at least about 0.5% by weight magnesium, and at least about 0.5% of the total weight of said powder being magnesium alloyed with aluminum, the aluminum and magnesium constituting more than 50% by weight of said alloy said powder being present in said solution in an amount of about 250 to 1000 grams per liter of said solution and being bonded in said layer after curing thereof.

3,869,294
PHOSPHONITRILE POLYMER

Carroll W. Lanier, Zachary, and James T. F. Kao, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 5, 1973, Ser. No. 337,825
Int. Cl. C09d *5/18*
U.S. Cl. 106—15 FP **9 Claims**

1. A process for producing a fire retardant phosphonitrilate polymer comprising the steps of (a) heating an organophosphazene of general formula



wherein R is an organic radical of 1 to 8 carbon atoms and *n* is an integer of at least 3 to about 35 where R has 8 carbon atoms up to about 90 where R has 1 carbon atom with from about 1 to about 50 weight percent of a phosphonitrilic halide of general formula

$$(PNX_2)_n$$

wherein X is a halogen and *n* is an integer of at least 3 to about 90 to drive off an organic halide, and (b) reacting the resultant polymer with from about 1 to about 15 weight percent based on the weight of said resultant polymer of aqueous solution containing from about 5 to about 50 weight percent of alkali or alkaline earth metal hydroxide.

3,869,295
UNIFORM LIGHTWEIGHT CONCRETE AND PLASTER

Andrew D. Bowles, and Samuel J. Parsons, both of box 2405, Anchorage, Alaska 99501

Continuation-in-part of Ser. No. 24,022, March 30, 1970, Pat. No. 3,764,357. This application Mar. 23, 1973, Ser. No. 344,431. The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.
Int. Cl. C04b *7/02*
U.S. Cl. 106—90 **26 Claims**

1. In a method of preparing lightweight building material wherein

a lightweight aggregate comprising expanded polystyrene beads is admixed with an aqueous medium and inorganic cementitious material in amounts to produce a coherent formable uncured lightweight matrix which sets upon standing,

said matrix is formed into a body of uncured lightweight self-setting building material having a desired configuration and

said body is maintained in the desired configuration until it sets and the resulting set body is cured to form cured lightweight building material,

the improvement which comprises preparing the coherent formable uncured lightweight matrix from an aggregate consisting essentially of polystyrene beads expanded in hot water, the said polystyrene beads containing water from the expansion thereof in the hot water and the said water content causing the polystyrene beads to have a weight of at least 3 pounds per cubic foot, the polystyrene beads being admixed with the aqueous medium and inorganic cementitious material in the absence of an added homogenizing agent which aids in coating the polystyrene beads with the cementitious material, and the said body upon setting and curing being coherent and substantially free of cracks.

3,869,296

AQUEOUS STARCH-PIGMENT PAPER COATING COMPOSITIONS CONTAINING GLYOXAL-UREA INSOLUBILIZER

George Bernard Kelly, Jr., Gaithersburg, Md., and Robert Howard Lowery, Alum Creek, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 239,331, March 29, 1972, abandoned. This application June 20, 1973, Ser. No. 371,606

Int. Cl. C08b *25/02, 27/02*

U.S. Cl. 106—214 **5 Claims**

1. A paper coating composition of a pigment, starch and a latent water insolubilizer for said starch, said latent water insolubilizer being the reaction product of from 0.5 to 0.75 mole of urea per mole of glyoxal and having an average molecular weight of from 250 to 325, and being present in said composition at a concentration of from 2 to 10 percent by weight based on the weight of the starch.

3,869,297

ALUMINUM COATINGS BASED ON CLAY-EMULSIFIED ASPHALTS

Robert C. Bellomy, Baltimore, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 15, 1970, Ser. No. 46,518

Int. Cl. C08h *13/00;* **C08k** *1/62;* **C09d** *3/24*

U.S. Cl. 106—277 **6 Claims**

1. A coating composition consisting essentially of (1) about 750 parts by weight of a clay base asphalt emulsion having a non-volatile residue of from 30 to 55 percent weight and a clay to asphalt ratio of from about 0.05–0.40:1, wherein said asphalt has a penetration of 0 to about 250 at 77°F., a softening point in the range of from about 80° to about 300°F., and a mean particle size of from 4 to about 100 microns; (2) from about 50 to about 250 parts by weight of aluminum paste, the aluminum of said aluminum paste having been treated with an inhibitor to prevent reaction of the aluminum with water; (3) from about 50 to about 150 parts by weight mica; (4) from zero to about 2.5 parts by weight of a mixing stability additive; (5) from zero to about 250 parts by weight additional water; and (6) from zero to about 5 parts by weight sodium citrate hydrate with the proviso that the ratio of clay emulsion solids from said clay base asphalt emulsion to aluminum metal from said aluminum paste is in the range of from 1.5–8.0:1.

3,869,298

IRON OXIDE PIGMENTS AND PROCESS FOR THE PRODUCTION THEREOF

Morio Suzuki, Koube; Masayoshi Tachibana, Ikeda, and Takayoshi Moriai, Takatsuki, all of Japan, assignors to Teikoku Kako Co., Ltd., Osaki-shi, Japan

Filed Nov. 13, 1972, Ser. No. 305,987

Claims priority, application Japan, Nov. 12, 1971, 46-89786

Int. Cl. C09c *1/24*

U.S. Cl. 106—304 **12 Claims**

1. An iron oxide pigment consisting essentially of plate-like iron oxide particles having a smooth surface and a metallic luster, said surface being covered with a high refractive index transparent coating selected from titanium dioxide, hydrated titanium dioxide, zirconium dioxide and hydrated zirconium dioxide.

3,869,299

METHOD OF PREPARING A CALCIUM CARBONATE-MAGNESIUM HYDROXIDE PIGMENT

John Neil Periard, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 31, 1973, Ser. No. 393,703

Int. Cl. C09c *1/02*

U.S. Cl. 106—306 **21 Claims**

1. In a method of preparing a magnesium hydroxide-calcium carbonate product wherein dolime is slaked to hydrate calcium oxide to calcium hydroxide and magnesium oxide to magnesium hydroxide and the slaked dolime is carbonated to convert the calcium hydroxide to calcium carbonate, the improvement which comprises slaking the dolime in an aqueous solution containing a water soluble boron compound, thereby further enhancing the optical properties of the resultant magnesium hydroxide-calcium carbonate product.

3,869,300

METHOD OF INTERNALLY COATING DUCTS WITH SYNTHETIC RESIN

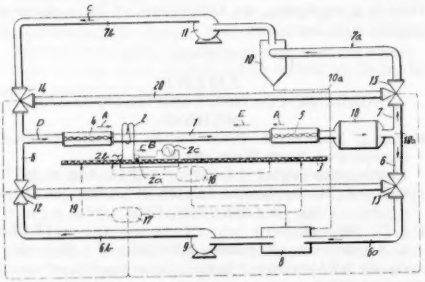
Werner Scheiber, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 22, 1971, Ser. No. 191,940

Claims priority, application Germany, Oct. 24, 1970, 2052314; Dec. 3, 1970, 2059548; Sept. 4, 1971, 2144342; Sept. 4, 1971, 2144377

Int. Cl. B44d *1/094, 1/095*

U.S. Cl. 117—17 **6 Claims**



1. A method of coating a surface of an elongated metal pipe, comprising the steps of:

a. clamping said pipe between seals and incorporating it in a closed gas-circulating system;

b. relative by displacing said pipe in a first direction through an induction coil to heat said pipe along at least the inner surface thereof;

c. sweeping a gas stream along said heated inner surface at a velocity between **3** and **10m/sec** with reference to said surface;

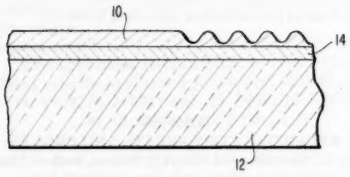
d. charging said gas stream with particles of a synthetic resin flowable at an elevated temperature, said particles having a particle size of 5 to 300 microns and being charged into said gas stream at a rate of 1,200 to 2,000 g/m³ (STP) thereof whereby said gas stream entrains said particles and said particles are fritted to said inner heated surface;
e. cooling said gas stream upon its emergence from contact with said inner heated surface;
f. recharging said cooled gas stream by metering additional synthetic resin particles at substantially the same rate at which said synthetic particles are fritted onto said inner heated surface;
g. recirculating said recharged cooled gas stream into contact with said inner heated surface to frit additional synthetic particles onto said surface;
h. separating excess resin particles nonadherent to said inner heated surface from said gas stream upon its emergence from contact with said inner heated surface to form a particle free gas stream;
i. cooling said particle free gas stream;
j. recirculating said cooled particle free gas stream while simultaneously induction heating said pipe with said coil to effect coalesence of the resin particles fritted to said inner surface by relatively displacing said pipe and said coil in the opposite direction to the movement in step (h); and
h. cooling said resin coated pipe to room temperature.

3,869,301

HOLOGRAPHIC RECORDING MATERIAL FOR INFRARED RADIATION

Gernot Decker, Garching; Hans Herold, Oberschleissheim, and Horst Rohr, Garching, all of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed June 11, 1973, Ser. No. 368,987
Claims priority, application Germany, June 16, 1972, 2229476
Int. Cl. B41c *1/06*
U.S. Cl. 117—36.1 **6 Claims**



1. A holographic rrcording assembly for use with infrared radiation comprising, in combination: a surface layer which is relatively transparent to the infrared radiation and is vaporizable by the effects of infrared radiation, and a substrate which is relatively highly absorbent of infrared radiation for receiving the infrared radiation passing through said surface layer, and wherein the surface layer, which is vaporizable by the effects of infrared radiation absorbed by said substrate, is deposited on said substrate; whereby vaporization of the actual recording layer takes place primarily beneath this layer in the vicinity of said substrate on which said surface layer is deposited by virtue of the infrared radiation absorbed by saaid substrate after passing through the surface layers.

3,869,302

METHOD FOR MANUFACTURE OF GRAPHITE FLOUR

Frederick L. Shea; Mack P. Whittaker, both of Johnson City, and Lloyd I. Grindstaff, Elizabethton, all of Tenn., assignors to Great Lake Carbon Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 61,808, Aug. 6, 1970, abandoned. This application Aug. 1, 1972, Ser. No. 276,990
Int. Cl. C01b *31/04*
U.S. Cl. 117—46 CC **7 Claims**

1. A method for the manufacture of graphite flour which comprises:
a. nebulizing a graphitizable, carbon-forming pitch of coal or petroleum origin into spheres of about 10 to about 3000μ diameter;
b. coating the surface of the spheres with a thermosetting resin and setting the resin to prevent coalescence thereof when heating to above their melting point while in contact therebetween; and
c. carbonizing and graphitizing the coated spheres by heating to about 800°C.–1,000°C. then to about 2,500°C. – 3,000°C. in an inert atmosphere.

3,869,303

METHOD OF SURFACE MODIFICATION OF POLYMER MATERIALS

Vladimir Alexandrovich Orlov, Smolenskaya ulitsa, 10, kv. 101; Vera Dmitrievna Zaitseva, Novo-Gireevskaya, 4, kv. 109; Viktor Alexeevich Sinitsyn, ulitsa Festivalnaya, 24, kv. 100, and Ekaterina Efimovna Rostovtseva, Mosfilmovskaya ulitsa, 18, kv. 18, all of Moscow, U.S.S.R.

Continuation of Ser. No. 55,289, July 15, 1970, abandoned. This application Sept. 22, 1972, Ser. No. 291,344
Int. Cl. B44d *1/092*
U.S. Cl. 117—47 A **4 Claims**

1. A method of surface modification of a polymer selected from the group consisting of isoprene rubber, styrenebutadiene rubber, and natural rubber, to thereby improve substantially the surface adhesion properties thereof, comprising treating said polymer with an aqueous solution comprising a mineral acid, a mineral oxidant selected from the group consisting of potassium bromate, potassium permanganate, and sodium perchlorate and a member of the group consisting of sodium, potassium, and zinc salts of hydrochloric, hydroiodic and hydrobromic acids, the water, said mineral acid, said mineral oxidant and said salt in said aqueous solution being taken in a weight ratio of 50–1000:0.3–7:0.1–7:1–15, respectively.

3,869,304

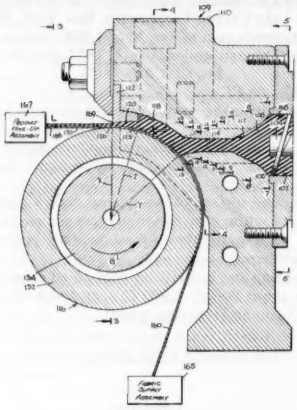
FABRIC COATING BY EXTRUSION DIE-CALENDERING APPARATUS AND METHOD

Jan Janusz Bogulslawski, New York, N.Y.; Paul Geyer, Detroit, Mich., and Frederick Nishwitz Taff, Roxbury, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Nov. 20, 1972, Ser. No. 308,142
Int. Cl. B44d *1/44*
U.S. Cl. 117—65.2 **4 Claims**

1. A method of coating a fabric with elastomeric stock wherein improved impregnation of the interstices of the fabric is achieved, said method comprising concomitantly feeding a fabric and extruding elastomeric stock in progressively increasing pressurized contact with said fabric between mutally confronting stationary and movable surfaces, one surface converging toward the other and cooperatively defining a wedge shaped pressure chamber terminating in a restriction orifice; and moving said movable surface in the direction of feed of both said stock and fabric to frictionally carry and wedge said stock and fabric into and through both said cham-

ber and restriction orifice during which interstices of said fabric are increasingly impregnated by said stock as the latter



undergoes a reduction in cross-sectional thickness under increasing pressure.

3,869,305

METHOD FOR PRODUCING AN OPAQUE COATING

Ehrlich M. Eiland, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 170,647, Aug. 10, 1971, Pat. No. 3,788,886, which is a continuation of Ser. No. 781,977, Dec. 6, 1968, abandoned. This application Oct. 29, 1973, Ser. No. 410,684. The portion of the term of this patent subsequent to Jan. 29, 1991, has been disclaimed.

Int. Cl. B44d *5/06*; **B32b** *15/08*

U.S. Cl. 117—66 **5 Claims**

1. A process for continuous production of an opaque coating on a substrate which comprises:

a. dispersing an organic liquid comprising at least 85% by volume paraffinic hydrocarbons and having a boiling point of at least about 300°F in a lacquer comprising as essential ingredients at least one cross-linkable resin comprising cellulose acetate proprionate or cellulose acetate butyrate having an hydroxyl content of at least about 4%, a cross-linking agent compatible with said resin, and an acid catalyst adapted for promoting cross-linking of said resin with said cross-linking agent, said boiling point being higher than the boiling point of said solvent, thereby forming a substantially clear coating composition comprising a dispersion of droplets of said organic liquid;

b. applying said coating composition to said substrate; and

c. heating said coating composition applied to said substrate sufficiently to first drive off said solvent and partially cure said lacquer on said substrate and thereafter drive off said organic liquid, with reaction between said resin and said cross-linking agent, thereby replacing said droplets with voids without any substantial precipitation of said lacquer, said voids scattering light sufficiently to form an opaque coating without requiring the use of dyes or pigments.

5. A process for continuous production of an opaque coating on a coil substrate which comprises:

a. unwinding the coil;

b. dispersing an organic liquid comprising at least 85% by volume paraffinic hydrocarbons and having a boiling point of at least about 300°F in a lacquer comprising as essential ingredients at least one cross-linkable resin comprising celulose acetate propionate or cellulose acetate butyrate having an hydroxyl content of at least about 4%, a cross-linking agent compatible with said resin, a solvent for said resin and said cross-linking agent, and an acid catalyst adapted for promoting cross-linking of said resin with said cross-linking agent, said boiling point being higher than the boiling point of said solvent, thereby forming a substantially clear coating composition comprising a dispersion of droplets of said organic liquid;

c. coating said unwound substrate with the clear coating composition of step (b);

d. heating curing said clear coating composition by heating said coating composition applied to said substrate sufficiently to first drive off said solvent and partially cure said lacquer on said substrate and thereafter drive off said organic liquid, with reaction between said resin and said cross-linking agent, thereby replacing said droplets with voids without any substantial precipitation of said lacquer, said voids scattering light sufficiently to form an opaque coating without requiring the use of dyes or pigments; and

e. rewinding said substrate into a coil.

3,869,306

GLASS FIBER REINFORCED ELASTOMERS

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, toledo, Ohio

Continuation of Ser. No. 398,305, Sept. 22, 1964, abandoned. This application Apr. 17, 1972, Ser. No. 244,589

Int. Cl. B32b *17/04*, *17/10*

U.S. Cl. 117—72 **2 Claims**

1. In a glass fiber reinforced elastomeric product in which an elastomeric material constitutes a continuous phase in which the glass fibers are distributed, the improvement in the bonding relationship between the glass fibers and the elastomeric material in which the glass fibers are distributed wherein the glass fibers are in the form of a bundle of a plurality of glass fibers, each of the glass fibers having a thin size coating on the individual surfaces thereof consisting essentially of an anchoring agent in the form of an organo silicon compound having an organic group attached directly to the silicon atom which contains an amino group and an impregnant in the bundle to separate the glass fibers each from the other, said impregnant consisting essentially of a combination of a resorcinol-formaldehyde resin and a rubber.

3,869,307

RECEPTIVE COPY SHEETS AND PROCESS

Douglas A. Newman, and Albert E. Brown, both of Glen Cove, N.Y., assignors to Melvin Sharkey, Hewlett, N.Y.

Filed Oct. 4, 1972, Ser. No. 294,881

Int. Cl. C09j *7/02*; **B41m** *5/02*

U.S. Cl. 117—122 PA **12 Claims**

1. Receptive copy sheet comprising a flexible foundation having on the surface thereof a receptive coating which is capable of being imaged by means of ball-point pen ink, pressure-sensitive transfer compositions and liquid inks, said receptive coating comprising from about 25 percent to 90 percent by weight of a solid adhesive resinous binder material and from about 10 percent to 25 percent by weight, based upon the weight of said binder material, of polymer spheres consisting of an inert synthetic organic polymer and having an average particle size of from about 1 to 40 microns, said coating having said spheres at the surface thereof and being non-adhesive to the touch and said adhesive resinous binder being exudable under the effects of imaging pressure at ordinary room temperatures to displace the polymer spheres and render the surface of the coating adhesive in the impressed areas.

3,869,308
FORMING SIZE FOR GLASS FIBERS AND RESULTING PRODUCT

Roy R. Graham, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 27, 1973, Ser. No. 355,238
Int. Cl. C03c *25/02*
U.S. Cl. 117—126 GB **14 Claims**

8. An improved glass fiber strand suitable for the application of resin thereto and having disposed on the glass fibers an amount from about 0.80 percent to about 2.5 percent by weight of the glass, the dried residue of an aqueous size consisting essentially of 28 percent to 75 percent by weight of a starch; 4 percent to 52 percent by weight of the salt of a polyaminofunctional polyamide resin, said polyaminofunctional polyamide resin salt being formed from the condensation reaction product of a polycarboxcylic acid and a polyamine, said polyamine having greater than 2 amino groups per molecule and the carboxcylic acid having 1 to 5 carbon atoms; 5 to 25 percent by weight of a wax from the group consisting of animal waxes, vegetable waxes, mineral waxes and synthetic waxes and 9 percent to 77 percent by weight of a fatty triglyceride.

3,869,309
ANTISKID AGENT FOR BAGS

Gunnar Johan Fonne, Porsgrunn, and Thor Helge Jahnsen, Siljan, both of Norway, assignors to Norsk Hydro A.S., Oslo, Norway

Filed Mar. 21, 1973, Ser. No. 343,473
Claims priority, application Norway, Mar. 21, 1972, 909/72
Int. Cl. B44d *5/00*
U.S. Cl. 117—138.8 **4 Claims**

1. The method of securing stacked bags having plastic surfaces to prevent the slipping of such surfaces in relation to each other, comprising the application of a coating in the form of an aqueous or predominantly aqueous solution of a soluble lignin compound to the surface of the bags, wherein the concentration of the lignin solution is in the range from about 2.5–40% by weight, said aqueous solution being devoid of polymerization promoting components.

3,869,310
FLEXIBLE SHEET MATERIALS

Osamu Fukushima; Kunio Kogame, and Masami Sato, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 22,390, March 24, 1970, abandoned. This application Dec. 1, 1972, Ser. No. 311,130
Claims priority, application Japan, Apr. 2, 1969, 44-25781; Apr. 24, 1969, 44-32082; Apr. 26, 1969, 44-32463
Int. Cl. B44d *5/00;* **B32b** *27/24*
U.S. Cl. 117—138.8 A **12 Claims**

1. A process for preparing a fibrous sheet, comprising forming a non-woven fibrous mat of mixed-spun fibers comprising at least two kinds of polymeric materials selected from the group consisting of polyamides, N-methoxymethylated polyamides, polyesters, polystyrene, polyolefins, polyvinyl chloride, polyvinylidene chloride, polyvinyl acetate, polymethacrylates, polyvinyl alcohol, polyacrylonitrile and polyurethane elastomers, said at least two kinds of polymeric materials having different solvent solubilities,

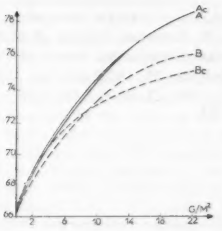
impregnating said mat with a first liquid which is a solvent for at least one of said polymeric materials but a non-solvent for the other polymeric materials at a temperature sufficiently low that said liquid substantially does not dissolve the polymeric materials for which it is a solvent; heating the impregnated mat to a temperature at which said polymeric material is partially or wholly dissolved, and the solution of said polymeric material is distributed through the fibrous mat, while substantially none of the other polymeric materials are dissolved into the first liquid, and

coagulating said polymer solution by treating said mat with a second liquid which is a non-solvent for all of the polymeric materials which constitute said mixed-spun fibers and which is at least partially miscible with said first liquid to form a porous polymeric structure which is substantially nonbonded to the fibers of said fibrous mat.

3,869,311
APPLICATION OF PRECIPITATES OF METHYLENE-UREAS AND PRODUCTS OBTAINED

Guy Jacquelin, and Solange Sangenis, both of Grenoble, France, assignors to Centre Technique de l'Industrie des Papiers Cartons et Celluloses, Isere, France

Filed May 28, 1970, Ser. No. 41,374
Claims priority, application France, June 3, 1969, 69.18236
Int. Cl. D21h *1/28*
U.S. Cl. 117—155 L **3 Claims**



1. A paper to which has been applied a filler product having as a base an insoluble and pulverulent methylene urea precipitate having a low degree of polymerization, the methylene urea precipitate having the following properties:

index of refraction between about 1.4 to 1.6,

diffuse reflection factor higher than 95% for an illumination of maximum wavelength between about 0.42 to 0.68 microns,

melting point between about 230° to 250°C.,

volume-mass between about 1.00 to 1.70 g/cu.cm.,

pH value of the isoelectric point between about 4 to 7, and a percent of nitrogen between about 30 and 38%.

3,869,312
ELECTRODES AND ELECTROCHEMICAL PROCESSES

Keith Graham Moss, and Nicholas William James Pumphrey, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 233,354, March 9, 1972,. This application Sept. 4, 1973, Ser. No. 394,394
Claims priority, application Great Britain, Mar. 18, 1971, 7211/71
Int. Cl. B44d *1/18*
U.S. Cl. 117—215 **11 Claims**

1. A method for manufacture of an electrode for use in electrochemical processes wherein said electrode comprises a support member made of a film-forming metal or an alloy thereof having a coating thereon consisting of at least one layer of a mixture of the oxide of at least one platinum group metal in a proportion of 20–80 percent by weight and a film-forming metal oxide and superimposed on the said layer a

layer consisting of a film-forming metal oxide which comprises the steps of (1) applying on said support member at least one coating of a composition comprising a thermally-decomposable compound of at least one platinum group metal and a thermally-decomposable organo-compound of a film-forming metal in an organic liquid vehicle, drying each coating by evaporation of the liquid vehicle and then heating each coating in an oxidizing atmosphere at a temperature of at least 350°C to convert the compounds of the platinum group metals and the film-forming metal to mixed oxides of these metals, and (2) applying over the layer of mixed oxides thus produced on the support member at least one coating of a thermally decomposable organo-compound of a film-forming metal in an organic liquid vehicle, said last-mentioned coating being free from any platinum group metal or compound thereof, drying each coating by evaporation of the liquid vehicle and then heating each coating in an oxidizing atmosphere to convert the organo-compound of the film-forming metal to the oxide of the metal.

3,869,313

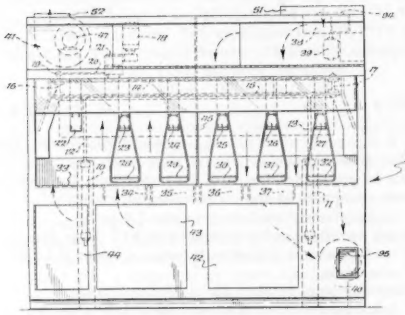
APPARATUS FOR AUTOMATIC CHEMICAL PROCESSING OF WORKPIECES, ESPECIALLY SEMI-CONDUCTORS

Harold F. Jones, Dover; David L. Ousterling, Mountain Lakes, and Roland W. Anderson, Sparta, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 21, 1973, Ser. No. 362,621

Int. Cl. B08b *3/02, 11/02*

U.S. Cl. 134—73 **11 Claims**



1. Apparatus for continuously treating workpieces with liquids comprising:

a. a plurality of treatment chambers

b. at least one of which is a dip chamber adapted to contain a liquid and

c. at least one of which is a spray chamber equipped with means to spray liquid on workpieces suspended within said chamber,

d. means for controlling the temperature of the treating liquid in at least one dip chamber,

e. means for maintaining the composition of a liquid mixture in at least one dip chamber within predetermined limits, and

f. conveyor means for automatically transferring the workpieces from treatment chamber to treatment chamber and lowering the workpieces through the top of the treatment chambers according to a predetermined timed cycle.

3,869,314

VENTED ELECTROCHEMICAL CELLS

Peter James Gillespie, Basingstoke, England, assignor to Energy Conversion Limited, London, England

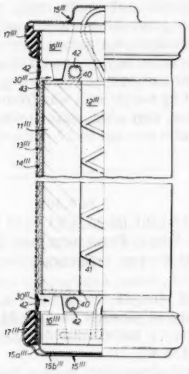
Division of Ser. No. 94,009, Dec. 1, 1970, Pat. No. 3,762,956.

This application Feb. 8, 1973, Ser. No. 330,509

Claims priority, application Great Britain, Dec. 3, 1969, 58918/69

Int. Cl. H01m *29/02*

U.S. Cl. 136—86 A **10 Claims**



1. A gas depolarized cell comprising:

a. an anode electrode, the anode electrode being apertured to contain electrolyte for the cell,

b. a cathode, the cathode including a layer of electrolyte-phobic material and surrounding the anode electrode,

c. an end cap closing at least one end of the cathode and structurally joined to the cathode, the cathode forming at the interior thereof a space, the electrolyte-phobic material of the cathode providing a surface through which gas within said interior space of the cell may pass to the exterior to allow gas pressures interiorly and exteriorly of the cell to equalize; and

d. an outer casing pervious to gas engaging the end cap and surrounding the cathode in spaced relation thereto.

3,869,315

LANYARD OPERATED MECHANICAL INITIATOR

Darrel D. Dolgner, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

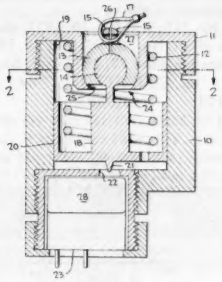
Filed Oct. 3, 1973, Ser. No. 403,139

Int. Cl. H01m *17/00*

U.S. Cl. 136—90 **10 Claims**

1. A mechanical actuation device comprising a housing having a bore extending thereinto from the open end thereof; a piston positioned at the other end of said housing; a hole located at the other end of said housing beneath said piston; a projecting member centrally connected to said piston; a ball located at the end of said member; a cap having an aperture therein, said cap located on said open end of said housing; a cylindrical depression in said cap; said aperture located in said cylindrical depression; said ball being located in said cylindrical depression; a hollow spherical collet split substantially in half and having a flat face orthogonal to said split; a round

hole located in said face and smaller than said ball; said collet located around said ball; a spring located between said cap



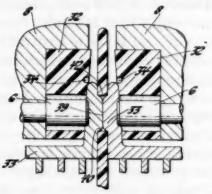
and said piston; and, two small flat rings, one attached to each portion of said collet.

3,869,316

ALLOY FOR THROUGH-THE-PARTITION INTERCELL CONNECTORS FORMED BY AN EXTRUSION-FUSION TECHNIQUE

Robert C. Matter, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1973, Ser. No. 418,462
Int. Cl. H01m *13/10*
U.S. Cl. 136—134 **1 Claim**



1. A method of making substantially liquid-tight intercell connections for lead-acid storage batteries of the type having (a) nonconductive partitions dividing the case of the battery into compartments, (b) apertures in the partitions connecting adjacent compartments, (c) cell groups in the compartments, (d) a plate connector strap on each cell group, and (e) upstanding lugs on the connector straps with the lugs facing each other on each side of the apertures, the lugs being thicker than a said partition and having face portions on their face sides adapted to fully engage the immediate surface ares of the partitions around the apertures and joint-forming portions circumscribed by said face portions and adapted by fusion to link one lug to the other through the apertures, said method comprising the steps of:

positioning the cell groups with their associated straps in the compartments so that the lugs of the straps overlay the apertures of the partitions with the face portions adjacent the immediate surface area around the apertures, said lugs being cast from a lead alloy consisting essentially of about 2 to 4.5 percent by weight antimony, at least 0.03 percent and less than about 0.3 percent by weight tin and less than 0.001 percent by weight sulfur and comprising a fine grained solid containing a major portion of antimony-lean-phase and a minor portion of antimony-rich phase;

positioning tool means on the back sides of the lugs, the tool means for each lug including a clamp portion, a bore in the clamp portion and a conductive plunger in the bore, the bores and plungers for opposing lugs being aligned with a substantial area of their associated aperture;

actuating said tool means to cause the clamp portions to engage the lugs with a sufficient clamping force to seal off the apertures with the face portions of the lugs, the joint-forming portions being spaced from each other midway through the apertures and with the partitions defining apertures which are substantially free of lug material;

while maintaining the clamping force, squeezing the plungers with sufficient plunger pressure (a) to cause the plungers to sink into the back sides of the lugs to a depth less than their thickness and short of the mouths of the apertures to extrude said lead alloy from the joint-forming portions of the lugs into the apertures to bridge the space therein and make a contact area between the lug extrusions approximately midway through the apertures, said contact area comprising about 15 to 75 percent of the area of the aperture as viewed in a direction normal to the partition, and (b) to store sufficient rapidly-expendable potential energy in appropriate means behind said plungers to cause quick and forceful flow of said lug extrusions in immediate response to a lessening of the lug extrusions' resistance to flow;

while maintaining pressure on the plungers and force on the clamp portions, passing electrical current through the plungers and lug extrusions in gradually increasing amounts to effect staged physical transformations in the lug extrusions including first softening the lug extrusions prior to fusion, then melting the antimony-rich-phase of the alloy at said contact area and finally melting the antimony-lean-phase of the alloy at the contact area, throughout which transformations the said stored potential energy rapidly expends itself as a continuous application of sufficient plunger pressure on the extrusions to cause flow of the melted antimony-rich-phase from near the center of the weld outwardly against the walls of the apertures before any sustantial melting of the antimony-lean-phase occurs thereby forming an antimony-rich annulus around an antimony-leaner weld center;

deenergizing the electrical current and allowing the fused lead alloy in the apertures to progressively solidify from the center of the weld zone radially outward toward the aperture walls while continuing to maintain the clamping force and plunger pressure to keep the apertures filled during the solidification whereby the cell groups are electrically joined by the lugs by liquid-tight, substantially void-free, through-the-partition connections having metallurgically strong antimony-rich annuli and metallurgically weaker antimony-lean centers; and

monitoring the quality of the weldments so made by selecting test samples and twisting the intercell connectors of the test samples in the plane of the partition until rupture occurs whereby antimony-rich and antimony-lean rupture zones are displayed, comparing the size of the antimony-lead alloy rupture zone against predetermined standards of acceptability and, if necessary, adjusting the welding conditions to bring the process back to within the acceptable range defined by those standards.

3,869,317

PRODUCING PROTECTIVE COATINGS ON METAL

Joachim Marx, Schwerinstr. 34-38, Muelheim, Ruhr-Styrum, Germany

Filed June 12, 1972, Ser. No. 261,854
Claims priority, application Germany, Dec. 8, 1971, 2160784
Int. Cl. C23f *7/08*
U.S. Cl. 148—6.15 R **11 Claims**

1. The process for the production of a protectively coated metal object which comprises applying to said metal object a material consisting essentially of at least one condensable phosphate of the formula

$Me_nX_2P_nO_{(3n+1)}$

in which

each X is a hydrogen or ammonium ion,

n is from about 4 to 100,

Me is an alkali metal ion which may be partially replaced by a hydrogen, ammonium or equivalent of a polyvalent metal ion,

and thereafter heating said phosphate to a temperature of about 600° to 1150°C whereby it undergoes condensation to produce a glass-like protective coating.

3,869,318

MOULD FOR MANUFACTURING PLASTIC ARTICLES, AND METHOD OF MANUFACTURING THE MOULD

Per Ingvar Hellman; Jan Ivar Sondell, and Bo Christian Jershed, all of Soderfors, Sweden, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed May 24, 1973, Ser. No. 363,412

Claims priority, application Sweden, May 26, 1972, 7206990

Int. Cl. B29c *1/02*; **C22c** *41/02*, *39/30*

U.S. Cl. 148—12.3 **4 Claims**

1. A steel mould for manufacturing plastic articles which consists essentially of a precipitation-hardened alloyed steel of 0.005% to 0.03% carbon, 6 to 7% nickel and 5.5 to 6.5% manganese, less than 0.4% silicon, up to 1.2% molybdenum, less than 0.035% phosphorus, less than 0.035% sulphur, and less than 0.01% nitrogen, balance iron.

3,869,319

WEAR RESISTANT DEPOSITED STEEL

Joo Ishihara; Hiromi Kagohara; Masaichi Nagai, all of Hitachi, and Yasushi Ohuchi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1973, Ser. No. 324,645

Claims priority, application Japan, Jan. 19, 1972, 47-6970

Int. Cl. C22c *39/50*; **B32b** *15/04*, *15/18*

U.S. Cl. 148—31.5 **6 Claims**

1. Wear resistant structure comprising a metal substrate and a layer of steel deposited thereon, said steel consisting essentially of, in weight percent, 32 to 40 percent of vanadium, 2 to 4 percent of nickel, and 0.5 to 3 percent of manganese, carbon of 0.3 to 0.6 percent higher than one-fifth of the vanadium content, and the balance being iron and impurities accompanying therewith, said steel having vanadium-carbide structure educed in a matrix mainly comprising martensite.

3,869,320

EXPLOSIVE COMPOSITION CONTAINING BIOPOLYMERIC MATERIAL, METHOD OF PREPARING AND USING

Horace William Walter Brett, Aberfeldie, and Richard Fox, Hawthorn, both of Victoria, Australia, assignors to ICI Australia Limited, Melbourne, Victoria, Australia

Continuation of Ser. No. 214,414, Dec. 30, 1971, abandoned. This application July 27, 1973, Ser. No. 383,046

Claims priority, application Australia, Jan. 11, 1971, 3673/71

Int. Cl. C06b *15/00*

U.S. Cl. 149—41 **19 Claims**

1. An aqueous, pumpable water-resistant slurry explosive composition suitable for use in wet boreholes, said composition consisting essentially of at least one oxygen releasing salt; water; at least one fuel; finely divided aluminum passing a 300 mesh sieve as sensitizing additive and biopolymeric material prepared from a carbohydrate which has been reacted with a microorganism of the genus *Xanthomonas*, the composition being free of any material capable of crosslinking the biopolymeric material.

3,869,321

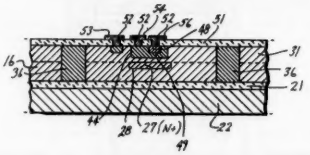
METHOD FOR FABRICATING PRECISION LAYER SILICON-OVER-OXIDE SEMICONDUCTOR STRUCTURE

Stanley R. Davis, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 219,542, Jan. 20, 1972, abandoned, which is a continuation of Ser. No. 38,754, May 19, 1970, abandoned. This application June 27, 1973, Ser. No. 373,940

Int. Cl. H01l *7/36*, *27/04*

U.S. Cl. 148—175 **1 Claim**



1. In a method for forming a silicon-over-oxide semiconductor structure with a precision layer, providing a semiconductor body of single crystalline silicon having first and second surfaces forming a layer of silicon dioxide on said first surface, forming a support structure on said layer of silicon dioxide, removing a portion of the body of single crystalline silicon by removing material from said second surface to provide a continuous layer of single crystal semiconductor material of a predetermined thickness adherent to said layer of insulating material, forming a buried layer of the same conductivity type as the semiconductor body in said body through said second surface, forming a region of opposite conductivity type in said body through said second surface and surrounding said buried layer, epitaxially growing a layer of single crystalline silicon on said second surface of said body to provide in combination with said body a combination layer which has a precise and uniform thickness throughout and which has a substantially planar surface, forming a layer of silicon dioxide on said planar surface, causing said region of opposite conductivity type to diffuse upwardly and downwardly so they extend between the first named layer of silicon dioxide and the layer of silicon dioxide on said planar surface so that the portion of semiconductor material enclosed within the opposite conductivity material is junction isolated from the other portions of the semiconductor material and forming a transistor in said epitaxial layer overlying said buried layer.

3,869,322

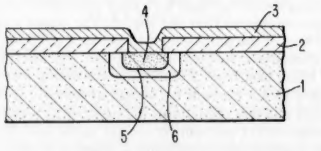
AUTOMATIC P-N JUNCTION FORMATION DURING GROWTH OF A HETEROJUNCTION

Jerome J. Cuomo, Bronx, and Harold J. Hovel, Putnam Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,415

Int. Cl. H01l *7/36*

U.S. Cl. 148—188 **18 Claims**



1. A process for the preparation of a p-n homojunction between regions of differing conductivity in a semiconductor substrate and a heterojunction at the surface of said substrate comprising

growing aluminum nitride or gallium nitride on the substrate to form said heterojunction whereby gallium atoms from said said gallium nitride or aluminum atoms from said aluminum nitride diffuse into said substrate in the regions of said substrate adjacent said aluminum nitride or gallium nitride to form said homojunction in said substrate.

3,869,323

METHOD OF POLISHING ZINC SELENIDE

Jagtar Singh Basi, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,240

Int. Cl. H01l *7/50*

U.S. Cl. 156—17 **11 Claims**

1. A method for polishing a zinc selenide surface to a high degree of surface perfection comprising:

maintaining said zinc selenide surface continuously wetted with an excess quantity of an aqueous chemical polishing solution comprising an alkali metal or alkaline earth metal hypohalite; and

continuously wiping the zinc selenide surface with a firm surface using a substantial pressure while maintaining a relative movement between the zinc selenide surface and the firm surface to remove the zinc selenide from the high points of the zinc selenide surface.

3,869,324

METHOD OF POLISHING CADMIUM TELLURIDE

Jagtar Singh Basi, Wappingers Falls, and Eric Mendel, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,420

Int. Cl. H01l *7/50*

U.S. Cl. 156—17 **10 Claims**

1. A method for the chemical-mechanical polishing of a cadmium telluride surface to a high degree of surface perfection comprising:

maintaining said cadmium telluride surface continuously wetted with an excess quantity of an aqueous chemical polishing solution comprising an alkali metal or alkaline earth metal hypohalite and an alkali metal carbonate, the alkali metal carbonate being at least equimolar to the alkali metal hypohalite; and

continuously wiping the cadmium telluride surface with a firm surface using a substantial pressure while maintaining a relative movement between the cadmium telluride surface and the firm surface to remove the cadmium telluride from the high points of the cadmium telluride surface.

3,869,325

METHOD OF MAKING A CONVOLUTE TUBE

Werner Witzig, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Division of Ser. No. 835,393, June 23, 1969, Pat. No. 3,704,730. This application Sept. 21, 1972, Ser. No. 291,134

Int. Cl. B31c *1/00*

U.S. Cl. 156—192 **4 Claims**

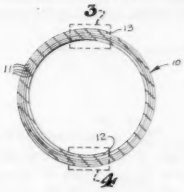
1. A method of making convolutely wound, adhesively secured tubes of at least two plies from elongate sheet material having opposed first and second surfaces and first and second longitudinal side edges and being characterized by eliminating the necessity of having a high moisture content in the adhesive for holding the wound tube together immediately following winding and thereby avoiding a subsequent drying step, said method comprising the steps of,

applying relatively slow acting, low moisture adhesive to a major portion of the first surface of the sheet material while leaving a first longitudinally extending band free of slow acting, low moisture adhesive in close proximity to the first longitudinal edge but spaced slightly therefrom allowing the slow acting, low moisture adhesive to be also positioned immediately along the first longitudinal edge, and while leaving a second longitudinally extending band free of slow acting, low moisture adhesive adjacent the second longitudinal side edge of the sheet material,

applying relatively fast acting adhesive along the first longitudinally extending band free of slow acting, low moisture adhesive on the first surface of the sheet material,

applying a lubricant along the second longitudinally extending band free of slow acting, low moisture adhesive on the first surface of the sheet material,

applying relatively slow acting adhesive on the second surface of the sheet material along a portion adjacent the second longitudinally extending edge, and



convolutely winding a predetermined length of the elongate sheet material transversely of the length into a convolute tube with the second surface of the sheet material forming the outside surface of the tube and with the second longitudinal edge having the lubricant adjacent thereto on the first surface and the adhesive adjacent thereto on the second surface forming the leading inside edge of the tube and the first longitudinal edge having the relatively fast acting adhesive adjacent thereto forming the outside trailing edge of the tube for immediate adherence of the trailing edge portion to the outside surface of the convolute tube to retain the convolute tube in the wound condition during activation of the slow acting, low moisture adhesive to bond the convolute tube in the wound condition.

3,869,326

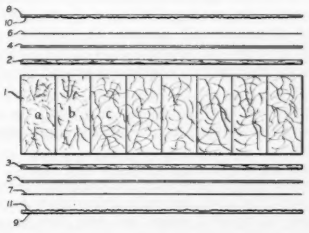
TEXTURED FILM FINISHED PANELS AND METHOD THEREFOR

William A. Matzke, 609 Somerset Dr., Green Bay, Wis. 54301

Continuation-in-part of Ser. No. 172,670, Aug. 18, 1971, Pat. No. 3,738,900. This application Mar. 7, 1973, Ser. No. 338,968

Int. Cl. B31f *1/00*

U.S. Cl. 156—209 **5 Claims**



1. A process for the manufacture of a uniformly embossed face film on a substrate which comprises: positioning between press plates of an embossing press a veneer sheet on a rigid substrate including an adhesive between their adjoining surfaces; applying a sheet of loosely bonded cellulose fibers impregnated with a thermoplastic resin to the veneer sheet; positioning a sheet of deformable thermoplastic film on the

cellulose fiber sheet, said deformable film having a thickness within the range of 0.0005 to 0.003 inches; and compressing the sheets and substrate in the embossing press under a die while heating the sheets to a temperature within the range of 200°F to 400°F to simultaneously effect lamination of the composite and embossment of the face film.

3,869,327

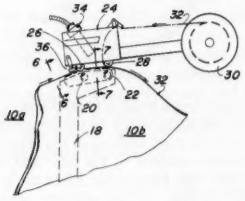
WATER TIGHT SEAMING OF FLEXIBLE THERMOPLASTIC SHEET MATERIAL

Everette M. Lambert, Littleton, and Richard L. Ball, Denver, both of Colo., assignors to Drake, Crandell & Batchelder, Ft. Collins, Colo.

Filed Sept. 5, 1972, Ser. No. 286,181

Int. Cl. B29c *27/02*; **A47c** *27/08*

U.S. Cl. 156—256 **2 Claims**



1. The method of making a water-tight reinforced envelope from a pair of flexible water impervious thermoplastic sheets by bonding said sheets to each other in face-to-face engagement along their peripheral edges to form a closed envelope bonded with a first peripherally continuous water-tight seam, wherein the improvement comprises the steps of:

cutting a slit in one of the sheets for receiving a sealing head adapted for positioning within the interior of the envelope for compressive sealing cooperation with a moveable head in juxtaposition therewith exterior of the envelope, inserting said sealing head through said slit and positioning said sealing head within said envelope,

feeding an elongate peripherally extending strip of thermoplastic material into overlying exterior relationship with said first seam and with said first seam extending along substantially the longitudinal center line of said strip,

heating said envelope and seam immediately in front of the point of contact between said envelope and said strip,

continuously compressing said strip to said heated envelope sheets along second peripherally continuous seams spaced from and on opposite sides of and parallel to said first seam to form two continuous spaced parallel bands respectively adjacent the side edges of said strip with said second seams continuously bonding said strip to respective ones of said sheets around the entire periphery of said envelope,

compressing said strip to each of said heated envelope sheets at a plurality of spaced discontinuous central bonding zones extending generally transversely intermediate said spaced parallel bands and said first seam and in spaced relationship with respect to said bands and first seam,

feeding said strip to cover the entire first peripheral seam and thermally bonding the ends of said strip to each other,

and sealing said slit after withdrawal of the interior head from the envelope, thereby to form a water-tight leakproof reinforced seam envelope.

3,869,328

REELING SELF-ADHESIVE LABELS

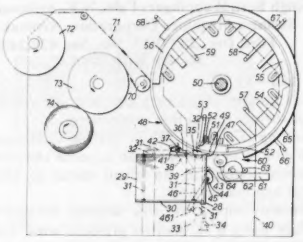
David John Instance, West Malling, England, assignor to David J. Instance Limited, Tombridge, Kent, England

Filed Mar. 15, 1973, Ser. No. 341,636

Claims priority, application Great Britain, Mar. 16, 1972, 12384/72

Int. Cl. B29c *17/00*

U.S. Cl. 156—285 **11 Claims**



1. A process for the production of a continuous reel of self-adhesive labels, wherein the labels are produced as separate flat sheets cut to finished size and stacked, the separate labels are then fed in succession from the stack onto the surface of a drum and held thereon by vacuum means while being fed to an applicator by which they are coated individually on their reverse sides with a pressure-sensitive adhesive composition, the adhesive is dried by passing the labels through a hot air chamber extending about a substantial part of the periphery of the drum and the labels are applied successively by their adhesive coated sides to a continuous web of release paper which moves against said drum and which is then reeled.

6. Apparatus according to claim **4** wherein the applicator comprises a doctor blade.

3,869,329

METHOD OF SEALING NYLON FILM USING BOILING WATER OR STEAM

Arthur J. Schweitzer, Jr., South Orange, and Eugene Schupak, Dover, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 23, 1971, Ser. No. 156,063

Int. Cl. C09j *5/02*; **B32b** *31/12*; **B29d** *9/00*

U.S. Cl. 156—308 **3 Claims**

1. A method for sealing polycaproamide film surface which comprises exposing said surface to boiling water or steam only as the adhering solvent and thereafter contacting said exposed surface with at least one other polycaproamide film surface whereby a seal is effected between the contacted surfaces.

3,869,330

APPARATUS FOR APPLYING A LABEL TO A PACKAGE

Andrew W. Anderson, West Caldwell, and John P. Mullin, Scotch Plains, both of N.J., assignors to Scandia Packaging Machinery Company, Clifton, N.J.

Filed Jan. 27, 1972, Ser. No. 221,336

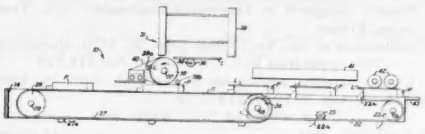
Int. Cl. B32b *31/20*; **B65b** *61/26*; **B65c** *9/36*

U.S. Cl. 156—380 **12 Claims**

1. In a labeling machine including means for moving a package in a path along a support means, the combination comprising:

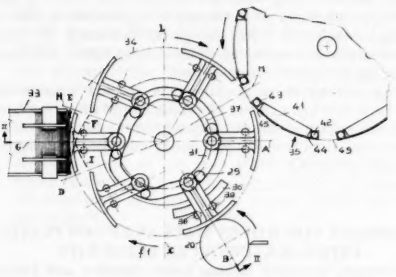
a. securing means for positionally securing a label to the package solely along one edge portion thereof and in a direction parallel to the direction of movement of the package along said path,

b. means for applying pressure progressively pressing the balance of the label from said edge portion across the



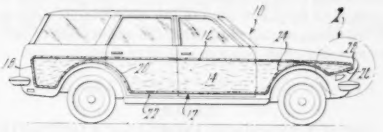
surface of the package to obtain a complete and uniform bonde between the label and the package.

3,869,331
DEVICE FOR WITHDRAWING LABELS FROM A STORE IN LABELLING MACHINES
Vittorio Saso, Via Irnerio 12/3, Bologna, Italy (40100)
Filed Nov. 13, 1972, Ser. No. 306,111
Int. Cl. B65c *9/08, 11/04*
U.S. Cl. 156—571 **3 Claims**



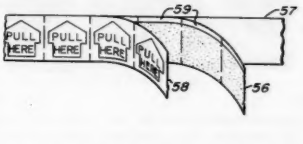
1. A device for withdrawing labels from a pack of labels contained in a fixed store of a labelling machine, comprising a base, a drive shaft rotatably supported by said base and driven with continuous motion, a plate rigid with said shaft, a plurality of oscillating elements pivotally supported by said plate in positions angularly spaced in a circle concentric with said shaft and each comprising a cylindrical segment portion having a development substantially equal to the length of the labels and lying on a circle substantially tangential to the front label of said pack of labels contained in said store, each of said oscillating elements further comprising an arm pivoted to said plate and extending substantially radially thereto and provided at its free end with said cylindrical segment portion and at its pivoting end with a lever having at least an idle roller for engagement with a groove defining a radial fixed cam, whereby the movement of said roller along the path of said groove causes each of said cylindrical segment portions to perform a rolling movement on the front label of said store, thereby progressively withdrawing said front label therefrom, said device further comprising a gumming roller for applying a film of glue on said cylindrical segment portions before they come into engagement with said labels and means for removing the labels from said oscillating elements, said means including a turntable provided with a plurality of blocks of substantially elastic material having a cylindrical external surface portion substantially equal to that of said cylindrical segment portions for contacting a corresponding one thereof during rotation of said plate and said turntable, said blocks being laterally provided with rods extending substantially parallel to the axis of said turntable and each provided with a pincer member projecting towards said cylindrical external surface portion, said rods being movable from a position in which said pincer members are spaced from said cylindrical external surface portion for engaging said labels held by said oscillating elements into a position in which said pincer members hold said labels into contact with said blocks.

3,869,332
AUTO TRIM
Theodore Loew, Schenectady, N.Y., assignor to The Standard Products Co., Dearborn, Mich.
Filed July 27, 1973, Ser. No. 383,242
Int. Cl. B37b *33/00*
U.S. Cl. 161—31 **2 Claims**



2. In a method of trimming the sides of a vehicle with a simulated wood decorative assembly which includes the steps of: bonding a panel of plastic material having a simulated wood exterior surface to the sides of the vehicle, bonding a plurality of relatively straight moldings of plastic material having a simulated wood exterior surface about the periphery of said panel with the end portions thereof spaced from one another, forming an annulus of plastic material having a radial cross-section and exterior finish similar to that of said moldings, cutting corner sections from said annulus, and bonding said corner sections between said spaced end portions so as to have the outer edge of said moldings disposed tangentially related to the outer periphery of said corner sections.

3,869,333
WEB OF DOUBLE-FACED PRESSURE-SENSITIVE STICKERS
Samuel B. McMaster, Deerfield, Ill., assignor to Do-It Corporation, Highland Park, Ill.
Division of Ser. No. 104,420, Jan. 6, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 428,623
Int. Cl. B32b *3/10*; **B33b** *7/06*; **C09j** *7/02*
U.S. Cl. 161—39 **1 Claim**



1. A web of double-faced pressure-sensitive stickers having the pressure-sensitive coatings arranged on opposite faces along a longitudinally extending zone extending less than the full width of the web, leaving each sticker with an edge portion bare on both faces by which it may be manipulated, said adhesive portions each being covered by a carrier strip guarding one face, and a guard strip guarding the other face and extending over the bare edge portion of each sticker whereby the edges of the sticker and guard strip may be jointly curled and grasped for joint removal from the carrier strip, the double-faced web and said guard strip being jointly readily separable along successive predetermined transverse lines while the carrier strip is relatively tear-resistant as compared to the double faced web and guard strip, whereby successive separate stickers, each with its guard piece portion of the guard strip, may be jointly pulled loose from the carrier strip by grasping the uncoated zone, then jointly applied to one of two things to be joined; the guard piece then being removed by grasping its free edge.

3,869,334

INSULATING MATERIALS

John Thomas Hughes, Mamble, near Kidderminster, and Joseph Anthony MacWilliam, Kidderminster, both of England, assignors to Micropore Insulation Limited, Kidderminster, England

Division of Ser. No. 151,970, June 10, 1971,. This application Sept. 11, 1973, Ser. No. 396,295

Int. Cl. B32b *5/16, 5/22*

U.S. Cl. 161—87 3 Claims

1. A rigid thermal insulating panel consisting essentially of an envelope of glass fibre cloth containing a pressure-consolidated mass of microporous silica aerogel being bonded to said cloth by penetration of the microporous silica aerogel into the pores of said cloth from the application of said pressure and said cloth being in a state of tension.

3,869,335

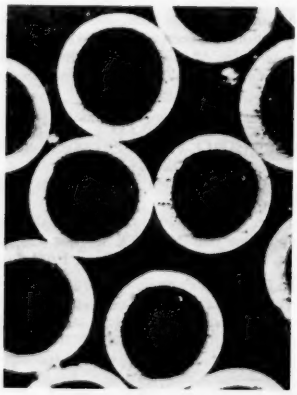
IMPACT RESISTANT INORGANIC COMPOSITES

August C. Siefert, Goose Ln., Granville, Ohio 43023

Division of Ser. No. 120,932, March 4, 1971, Pat. No. 3,702,240, which is a continuation-in-part of Ser. No. 820,015, April 28, 1969, abandoned. This application Aug. 9, 1972, Ser. No. 278,905

Int. Cl. B32b *17/04*; C03c *23/20*

U.S. Cl. 161—143 9 Claims



1. A strong light-weight composite useful at elevated temperatures and exhibiting apparent ductility comprising: generally parallel glass fibers having a silica content of at least approximately 50 percent by weight, a uniform sheathing of a thickness between 0.00005 and **0.001** inch of a metal from the group consisting of aluminum, copper, nickel, lead, zinc, tin, magnesium, indium, cadmium, antimony, bismuth, titanium, chromium, molybdenum, zirconium, and iron around the individual fibers, said sheathed fibers being bonded together in a glass matrix by a matrix glass of a composition different from that of said fibers and which has a softening point below the melting point of the metal sheathing, said matrix glass being fused to the metal sheathing on the fibers, the glass fibers and metal sheathing occupying from approximately 20 to approximately 70 percent by volume of the composite, and said sheathing effectively isolating the glass of said fibers from said matrix glass to provide a glass composite that is deformable and shatter resistant.

3,869,336

TRANSFER SHEETS FOR TRANSFER PRINTING

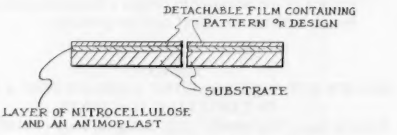
Pierre Sander, and Christian Mullier, both of Tourcoing, France, assignors to Trentesaux-Toulemonde S.A., Tourcoing, France

Continuation of Ser. No. 75,988, Sept. 28, 1970, abandoned. This application Dec. 7, 1972, Ser. No. 311,725

Claims priority, application Switzerland, Sept. 26, 1969, 14585/69; Aug. 6, 1970, 11832/70

Int. Cl. B41m *3/12*; B32b *7/06*

U.S. Cl. 161—146 19 Claims



1. A transfer sheet for transfer printing which comprises a paper or regenerated cellulose substrate carrying on at least one of its faces a detachable film layer containing a pattern or design, said film being separated from the substrate by a layer consisting essentially of a mixture of nitrocellulose and an aminoplast selected from the group consisting of urea-formaldehyde and melamine-formaldehyde resins said layer containing 40 to 60% nitrocellulose.

17. A transfer sheet as claimed in claim 1 wherein the detachable film layer carries an aluminum foil which is coated on its side opposite that side adjacent to the detachable film layer with a vinyl chloride polymer or copolymer, an acrylic resin or a polyamide.

3,869,337

COMPOSITE NON-WOVEN MATS AND FOAM PLASTIC ARTICLES REINFORCED THEREWITH

Peter Hoppe, Troisdorf; Helmut Leyer, Opladen, and Johann Muller, Cologne, all of Germany, assignors to Beyer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 11, 1972, Ser. No. 225,666

Claims priority, application Germany, Feb. 12, 1971, 2106729

Int. Cl. B32b *5/18*

U.S. Cl. 161—159 2 Claims

1. In a foam plastic article or foam core having marginal zones reinforced with a fiber mat, the improvement which comprises using as the fiber mat, a composite non-woven synthetic fiber mat consisting of a non-woven mat of crimped synthetic polyamide staple fibers having a titer of 40–100 dtex and a weight of 80–200 gm/m² and a second non-woven mat of fine titer textured synthetic staple fibers or textured synthetic filaments, said second non-woven mat having a titer of 2–10 dtex and a weight of 50–500 gm/m² and being firmly bonded to one surface of the non-woven polyamide fiber mat and said second non-woven mat being positioned adjacent to the outer surface of the marginal zone wherein the coarse fibers comprise from about 25 percent to about 60 percent of the combined weights per square meter of the coarse and the fine fiber mats.

3,869,338

TUBING FOR CRYOGENIC USE

Sheldon Kavesh, Whippany, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 14, 1972, Ser. No. 234,636

Int. Cl. F16l *55/04*

U.S. Cl. 161—165 10 Claims

1. Tubing suitable for use at cryogenic temperatures, said tubing being composed of a copolymer of ethylene and a comonomer selected from the group consisting of vinyl acetate and ethyl acrylate, wherein the molecular weight of said

copolymer is such that its melt index, as determined by the test procedure of ASTM-D-792-60T, is not greater than the value of the relationship:

$$\frac{\text{Weight per cent comonomer in copolymer}}{6}$$

and wherein the ratio of the outside diameter to the inside diameter of said tubing is at least about 1.5.

3,869,339

PREPARATION OF FLEXIBLE SHEETS OF POLYCRYSTALLINE ALUMINA-CONTAINING FIBERS

Ashok Kumar Dhingra, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 11, 1973, Ser. No. 350,127
Int. Cl. B32b *27/04, 27/12*
U.S. Cl. 161—170 **10 Claims**

1. A flexible, integral sheet of a composite consisting essentially of

A. continuous filament polycrystalline refractory oxide fibers containing at least about 60% Al_2O_3 by weight and which have a fiber diameter of between about 5 and about 50 microns, said fibers being substantially uniaxially aligned in the composite and being present in the composite in an amount of between about 15 and about 80 percent by volume, and

B. a substantially amorphous organic polymer having a glass transition temperature of about 20°C. or less, has a modulus of elasticity of less than about 0.1×10^6 psi., and which undergoes a substantially residue-free thermal decomposition at temperatures between about 300° and about 800°C.

3,869,340

PHOSPHORUS ORGANOSILANE ADHESIVES

Hans-Joachim Kotzsch, Rheinfelden; Jurgen Amort; Hans Junger, both of Troisdorf; Heinz Nestler, Niederkassel, and Franz Weissenfels, Siegburg, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Oct. 27, 1972, Ser. No. 301,700
Claims priority, application Germany, Nov. 3, 1971, 2154590
Int. Cl. B32b *9/04, 17/06*
U.S. Cl. 161—182 **6 Claims**

1. A composite article comprising a polymeric organic substance and an inorganic oxidic surface or metallic surface, said composite having at the interface between the metal or oxidic surface and the organic substance a phosphorus organosilane of the formula

$$(RO)_2\overset{O}{\overset{\|}{P}} - (A_m - B_n)_y - A_p - \overset{R_x}{\overset{|}{Si}} (OR)_{3-x}$$

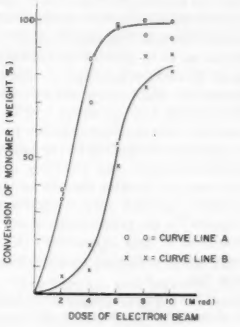
wherein *m*, *n*, *p*, *x* are 0 or 1; *y* is 1 to 20; R is independently a substituted or unsubstituted aliphatic radical; A is independently a bivalent alkylene group, a bivalent arylene group, a bivalent oxyalkylene group joined by its oxygen atom to the phosphorus atom or a bivalent oxyarylene group joined by its oxygen atom to the phosphorus atom; and B is a radical selected from the group consisting of a bivalent oxygen radical, an —NH—radical, an —NR— radical and an —S— radical, when p is equal to 1.

3,869,341

PLYWOOD COMPRISING IONIZING RADIATION CURED CROSS-LINKED DIALLYL PHTHALATE ACRYLONITRILE POLYMER AND METHOD OF MAKING

Masao Gotoda; Kenji Yokoyama, both of Osaka; Yoshimi Kono, Amagasaki; Shigekazu Toyonishi, Osaka; Kunio Hiwano, and Takaitsu Shimoyama, both of Hiroshima, all of Japan, assignors to Japan Atomic Energy Research Institute, Minato-ku, Tokyo, Japan

Division of Ser. No. 35,644, May 8, 1970, abandoned. This application Apr. 3, 1972, Ser. No. 240,862
Claims priority, application Japan, May 9, 1969, 44-35236
Int. Cl. B32b *21/04;* **B05c** *5/00;* **B01j** *1/10*
U.S. Cl. 161—270 **12 Claims**



11. A wood-polymer composite plywood consisting essentially of a plurality of laminated thin wooden layers, at least one of the thin layers being impregnated with an ionizing radiation cured, cross-linked diallyl phthalate-acrylonitrile polymer; said cured polymer being intimately united with said wooden layers.

3,869,342

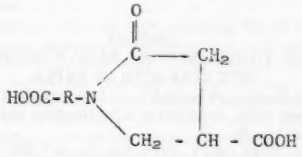
CATIONIC THERMOSETTING RESIN COMPOSITION FOR IMPROVING WET STRENGTH OF PAPER

Francis S. Munjat, Philadelphia, and Samuel Ho Kim, Haverford, both of Pa., assignors to E. F. Houghton and Company, Philadelphia, Pa.

Filed June 7, 1973, Ser. No. 367,801
Int. Cl. D21h *3/58;* **C08g** *41/04*
U.S. Cl. 162—164 **10 Claims**

1. A cationic thermosetting resin composition comprising a mixture of a first polyamine polyamide polymer A, and for each mol of polymer A, from about 0.5 to about 14.4 mols of a second polyamine polyamide polymer B or C or a mixture thereof, said polymer A having been prepared by heating at a temperature of from about 150° to about 165°C. a mixture of:

a. a heterocyclic dicarboxylic acid of the formula:



where R is an alkylene radical containing from 1 to 10 carbon atoms or an arylene radical, and for each mol of dicarboxylic acid;

b. an amino carbonyl compound which is an amino acid of the formula H_2N–R'–COOH or a lactam of the formula:

where R' is an alkylene radical containing from 1 to 10 carbon atoms or an arylene radical, and R'' is an alkylene radical containing from 3 to 10 carbon atoms;

c. a portion of the total amount of an amine which is a diamine of the formula H_2N–R'''–NH_2 or a polyalkylene-polyamine of the formula H_2N–(R^{iv}–NH)$_n$–H where R''' and R^{iv} are alkylene groups containing from 2 to 6 carbon atoms, and n is an integer from 1 to 5; cooling the resulting first intermediate reaction product VIII, combining

d. itaconic acid with said first intermediate reaction product in an amount so as to provide an excess of itaconic acid with respect to carbonyl groups to amine groups of said first intermediate and heating the mixture to a temperature of from about 110° to about 140°C. under reflux to obtain a second intermediate reaction product X, adding a further quantity of reactant (c) to said second intermediate reaction product and effecting condensation and removal of water by heating the mixture to a temperature of about 185°C., to form a water-soluble polyamide polyamine polymer XI, the proportions of reactants employed being from 0 to 4 mols of reactant (b), 1 to 3 mols of reactant (c) and 1 to 2 mols of reactant (d) for each mol of reactant (a),

said polymer B having been prepared by heating together at reflux at about 105°C a mixture of from 1 to 5 mols of reactant (b) and from 1 to 4 mols of (c) to obtain intermediate polymer XIII, cooling said reaction mixture and adding thereto incrementally from 1 to 3 mols of epichlorohydrin to form intermediate XIV, heating the reaction product to a temperature of from 160° to 185°C. to obtain polymer XV;

said polymer C having been prepared by heating together at a temperature of from about 135° to about 165°C. under reflux conditions a mixture of reactant (a), and for each mol of reactant (a), from 0 to 5 mols of reactant (b) and from 1 to 3 mols of reactant (c), adding water to said reaction mixture and cooling said mixture to a temperature of from about 80° to about 90°C., adding slowly to said reaction mixture from 1 to 3 mols of epichlorohydrin and heating the resulting mixture to a temperature from about 165° to about 215°C. to remove water of condensation to obtain a polymer containing the repeating units XVII and XVIII

adding to said mixture of polymers from about 0.5 to about 1.8 mols of epichlorohydrin per secondary amine group in said polymers and heating the resulting mixture at a temperature of from about 70° to about 76°C. until a Gardner-Holdt viscosity greater than J is obtained.

3,869,343

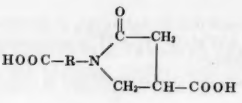
CATIONIC THERMOSETTING RESIN FOR IMPROVING WET STRENGTH OF PAPER

Francis S. Munjat, Philadelphia, and Samuel Ho Kim, Haverford, both of Pa., assignors to E.F. Houghton and Company, Philadelphia, Pa.

Filed June 7, 1973, Ser. No. 367,802
Int. Cl. D21h *3/58*; **C08g** *20/20*
U.S. Cl. 162—164 **10 Claims**

1. A cationic thermosetting resin prepared by heating at a temperature of from about 150° to about 165°C. a mixture of:

a. a heterocyclic dicarboxylic acid of the formula:



where R is an alkylene radical containing form 1 to 10 carbon atoms or an arylene radical, and for each mol of dicarboxylic acid,

b. an amino carbonyl compound which is an amino acid of the formula H_2N—R'—COOH or a lactam of the formula:

where R' is an alkylene radical containing from 1 to 10 carbon atoms or an arylene radical, and R'' is an alkylene radical containing from 3 to 10 carbon atoms;

c. a portion of the total amount of an amine which is a diamine of the formula H_2N—R'''—NH_2 or a polyalkylene-polyamine of the formula H_2N—(R^{iv}—NH)$_n$—H where R''' and R^{iv} are alkylene groups containing from 2 to 6 carbon atoms, and *n* is an integer from 1 to 5; cooling the resulting first intermediate reaction product VIII, combining

d. itaconic acid with said first intermediate reaction product in an amount so as to provide an excess of itaconic acid with respect to carbonyl groups to amine groups of said first intermediate and heating the mixture to a temperature of from about 110° to about 140°C. under reflux to obtain a second intermediate reaction product X, adding a further quantity of reactant (c) to said second intermediate reaction product and effecting condensation and removal of water by heating the mixture to a temperature of about 185°C., to form a water-soluble polyamide polyamine polumer XI, the proportions of reactants employed being from 0 to 4 mols of reactant (b), 1 to 3 mols of reactant (c) and 1 to 2 mols of reactant (d) for each mol of reactant (a), diluting said polyamine polyamide polymer with water to provide a solution containing from about 18 to about 25% by weight of polymer, adding to said polymer solution from about .05 to about 1.8 mols of epichlorohydrin per secondary amine group in said polymer while maintaining the temperature of said polymer solution at from about 40° to about 60°C., and thereafter heating said polymer solution to a temperature of from about 70° to about 80°C. to provide a cationic thermosetting resin.

3,869,344

FLEXIBLE CERAMIC MEMBER HAVING A PRE-LOADED TENSILE FORCE APPLYING MEANS

Robert F. Hunt, Concord, Tenn., assignor to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 273,308, July 19, 1972, abandoned. This application July 10, 1973, Ser. No. 377,894
Int. Cl. D21f *1/48*; **D21g** *3/00*
U.S. Cl. 162—274 **7 Claims**

1. In a system including at least two members one of which is movable relative to the other and in frictional engagement therewith, such as members in a papermaking system, the improvement wherein the other member is an elongated flexible ceramic element comprising

a plurality of ceramic segments, each having at least two opposite surfaces that are substantially flat and parallel, said segments being aligned with their flat faces in abutting face-to-face relation and in respective planes that are oriented substantially perpendicular to the composite length of said plurality of segments,

tension means anchored to opposite ends of said element and forcing said segments toward each other in a direction along their composite length and substantially perpendicular to their respective parallel faces with a preload force on said tension means, when said latter member is in an undeflected condition, that is at least the force calculated by the equation:

$$P = \frac{E_c A_c \dfrac{8dh}{\frac{2}{}\ \frac{2}{}}(L)}{\dfrac{l}{2} + 4d} + \frac{(\alpha_s - \alpha_c)\,\Delta T}{\frac{1}{A_s E_s} - \frac{1}{A_c E_c}}$$

where:

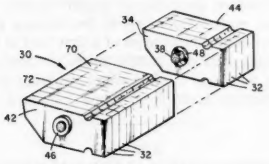
P is the preload of said tension means, in pounds;

E_c is the modulus of elasticity of the ceramic material;

A_c is the cross-sectional area of a ceramic segment in a plane perpendicular to the composite length of said elongated ceramic element in square inches;

d is the maximum anticipated deflection of said elongated ceramic element, in inches;

h is the dimension of a ceramic segment in the plane perpendicular to the composite length of said elongated ceramic element and in alignment with the direction of said deflective force, in inches;



l is the overall length of said latter member;

α_s is the coefficient of thermal expansion of said tension means;

α_c is the coefficient of thermal expansion of said ceramic;

Δ_T is the degree of temperature change anticipated, in degrees F.;

A_s is the cross-sectional area of said tension means,

E_s is the modulus of elasticity of said tension means, and

L is the length of a ceramic segment, in inches,

but less than the amount of preload force which will compress said ceramic to over about one-half of its maximum compressive strength,

whereby loading forces exerted upon said elongated ceramic element are directed thereagainst in a direction substantially perpendicular to the longitudinal dimension thereof and deflection of said elongated ceramic element pursuant to such loading forces is compensated for in said compressed segments by further compression of said segments in those portions of the abutting faces thereof disposed along the inside of the line of curvature of said elongated ceramic element and by relief of less than all of the compression in those portions of said abutting faces that are disposed along the outside of said line of curvature of said elongated ceramic element without physical separation of said segments at their abutting faces.

3,869,345

LIMONOATE DEHYDROGENASE AND PREPARATION THEREOF

Shin Hasegawa, Pasadena, and Linda C. Brewster, Carson, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 323,466, Jan. 15, 1973, abandoned, which is a division of Ser. No. 250,764, May 5, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 399,890

Int. Cl. C12d *13/10*

U.S. Cl. 195—62 **3 Claims**

3. The enzyme, limonoate dehydrogenase, produced by culturing *Arthrobacter globiformis* on a nutrient medium containing limonoate ions, which has the specific ability of converting limonate A-ring lactone into 17-dehydrolimonoate A-ring lactone, which exhibits optimum activity at a pH of about 9.5, and which requires for its activity the presence of nicotinamide-adenine nucleotide.

3,869,346

PROCESS FOR THE PREPARATION OF ANTIMYCIN A

Claude Vezina; Rene Saucier, and Surendra N. Sehgal, all of Montreal, Quebec, Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 128,523, March 26, 1971, Pat. No. 3,746,623. This application Jan. 29, 1973, Ser. No. 327,370The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.

Int. Cl. A61k *21/00*

U.S. Cl. 195—80 R **1 Claim**

1. In the process of producing Antimycin A by propagation in a suitable aqueous fermentation medium containing containing animal or vegatable oils or fats, a source of carbohydrate, ammonium sulfate, calcium carbonate, and other necessary nutrients, of a strain of Streptomyces capable of producing Antimycin A when so propagated under aerobic conditions, the improvement which comprises optimizing yields of Antimycin A by a combination of steps including

a. continuous adding to the fermentation medium a source of assimilable carbon selected from the class consisting of carbohydrates, vegetable oils and animal oils at the rate of from 0.5 to 2.0 volume percent of the fermentation medium per day while controlling the pH of the fermentation medium at approximately 6.0 by discontinuously adding during the course of the fermentation a pH 6 maintaining amount of either a mineral acid or an inorganic alkaline solution, the assimilable carbon addition beginning within about 24 to 36 hours after commencement of fermentation and the pH control commencing when the fermentation medium pH falls to approximtely 6.0, and

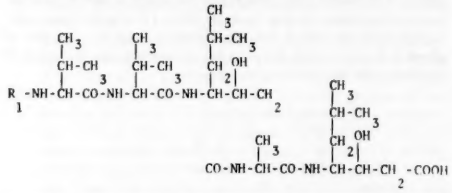
b. recovering Antimycin A by adjusting the pH of the fermentation medium to approximately 9.0, maintaining said pH for approximately 30 minutes, adjusting the pH of the fermentation medium to approximately 2.5, filtering the fermentation medium in the presence of an added solid filter aid material, separating the filter cake having associated therewith the fermentation mycelium, extracting the filter cake and associated mycelium with methylene chloride, ethylene chloride, chloroform or benzene, drying and evaporating the solvent extract under subatomspheric pressure to obtain an oily residue containing antimycin A, and separating the Antimycin A from the oily residue.

3,869,347
PROCESS FOR THE PRODUCTION OF NEW PEPSTATINS HAVING ANTI-PEPSIN ACTIVITY

Hamao Umezawa, Tokyo; Tetsuji Miyano, Nagoya; Kohtaro Funaishi, Okazaki; Tomio Takeuchi, Tokyo, and Takaaki Aoyagi, Fujisawa, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Continuation-in-part of Ser. No. 233,533, March 10, 1972, abandoned. This application Aug. 9, 1973, Ser. No. 387,139
Claims priority, application Japan, Mar. 26, 1971, 46-17292
Int. Cl. C12d *13/02*
U.S. Cl. 195—80 R 2 Claims

1. A process for the production of pepstatin derivatives acting as pepsin inhibitors, which have the formula



wherein R_1 is n-caproyl or iso-caproyl or an alkyl ester thereof wherein the alkyl group contains 1–4 carbon atoms characterized in that *Streptomyces testaceus* ATCC No. 21469 or *Streptomyces argenteolus* var. *toyonakensis* ATTC No. 21468 is cultivated in a nutrient medium containing assimilable carbon sources and nitrogen sources for 3–10 days under aerobic conditions, the culture medium extracted with n-butanol, the extract concentrated to a syrup, precipitation effected by adding water to said syrup, and the pepstatin derivatives thus precipitated are purified by the aid of methyl esterification.

3,869,348
DETERMINATION OF AMYLASE

E. Melvin Gindler, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Filed Feb. 26, 1973, Ser. No. 335,736
Int. Cl. G01n *31/14, 33/16*
U.S. Cl. 195—99 10 Claims

1. An aqueous solution useful for the detection of amylase activity comprising an aromatic nitro containing compound reducible by lower sugars to give a reduced compound having a different color or color intensity, a color stabilizer, sufficient base to raise the pH above about 10, and at least about 0.03 mole/100 ml of a higher alkali metal cation, said color stabilizer being an iminodiacetic acid containing chelating compound having substantially no reducing properties.

3,869,349
METHOD FOR THE ENZYMATIC HYDROLYSIS OF CHOLESTEROL ESTERS

Charles T. Goodhue, and Hugh A. Risley, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

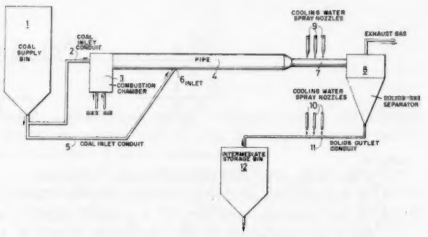
Filed Mar. 25, 1974, Ser. No. 454,659
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.5 R 10 Claims

1. In a process of assaying an aqueous proteinaceous liquid containing cholesterol esters for total cholesterol content in which said ester is hydrolyzed to liberate all of said cholesterol followed by determining the amount of cholesterol, the improvement comprising effecting said hydrolysis by treating said aqueous proteinaceous liquid with both a lipase having cholesterol esterase activity and a protease.

3,869,350
PROCESS FOR A THERMAL PRETREATMENT OF COKING BITUMINOUS COAL

Walter Goossens, and Wolfgang Hermann, both of Bardenberg, Germany, assignors to Eschweiler Bergwerks-Verein Aktiengesellschaft, Kohlscheid, Germany

Filed June 5, 1972, Ser. No. 259,957
Claims priority, application Germany, June 11, 1971, 2128949
Int. Cl. C10b *49/08*
U.S. Cl. 201—32 6 Claims

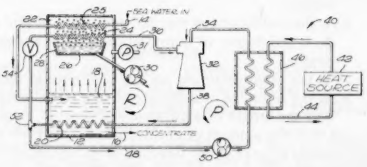


1. In a process for thermally preparing, in a heating gas stream, coking bituminous coal having a swelling index smaller than five, for the subsequent hot briquetting, the improvement comprising providing a horizontally flowing heating gas stream, supplying the bituminous coal as raw material having a substantially unsifted grain size of up to 14,000μ into said heating gas stream, assuring an average heat-up speed of about 1,000° C per second to bring the material to an average end temperature of about 400° C at the most by exposing different portions of the raw material to the heating gas stream for different lengths of time by supplying the different material portions to the heating gas stream at different locations downstream of a first feed in location, and upon reaching said end temperature, suddenly cooling the material by means of cooling water, whereby predrying and milling of the raw material have been obviated.

3,869,351
EVAPORATION SYSTEM AS FOR THE CONVERSION OF SALT WATER

Everett H. Schwartzman, Palos Verdes Estates, Calif.

Filed Nov. 9, 1973, Ser. No. 414,600
Int. Cl. B01d *3/02, 3/10*
U.S. Cl. 202—172 9 Claims



1. An evaporation system, as for the conversion of salt water by heat energy, comprising:

means for containing fluid to undergo conversion in a liquid phase and a gaseous phase and including means for removing condensed liquid from said gaseous phase;

first working-fluid means in heat-transfer relationship with said liquid phase;

second working-fluid means in heat-transfer relationship with said gaseous phase;

heat source means for transferring said heat energy to said working fluid to provide high-temperature working fluid;

compressor means connected to be activated by said

high-temperature working fluid to provide pressurized working fluid;

means for supplying said pressurized working fluid through said first working fluid means, then through said second working-fluid means to said compressor means;

means for supplying working fluid from said first working-fluid means to said boiler means;

means for securing a temperature difference between said first working fluid and said second working fluid;

means for obtaining and maintaining said contained fluid under vacuum.

3,869,352

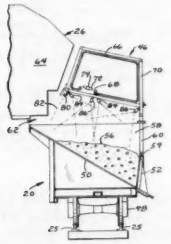
POLLUTION-FREE COKE QUENCHING SYSTEM

John E. Allen, Lake Forest, Ill.; John F. Hanley, Jr., Roswell, Ga.; Frank K. Armdur, Flossmoor; Frederick G. Krikau, Dolton, and Richard S. Patton, Flossmoor, all of Ill., assignors to Interlake, Inc.

Filed Jan. 17, 1972, Ser. No. 218,189

Int. Cl. C10b *39/04*

U.S. Cl. 202—227 **3 Claims**



1. In a coke quenching system, the combination comprising:

means defining at least one vehicle having a coke receiving cavity, a coke admitting opening communicating with said cavity and a coke releasing exit communicating with said cavity, and adapted to travel between a coke receiving station and a coke dumping station;

a hood on said vehicle means over said coke receiving cavity and adjacent one side of said coke receiving opening;

exhaust means on said vehicle means in fluid communication with said hood for withdrawing gases within said coke receiving cavity and including two-phase jet means for inducing a draft and for scrubbing gases withdrawn from said cavity to remove particulate material therefrom;

de-misting means on said vehicle means for receiving material from said two-phase jet means;

a plurality of quench spray jets on said vehicle means, all directed at the interior of said cavity;

and means establishing fluid communication between said de-misting means and said quench spray jets whereby liquid separated from gases thereby may be subsequently used for the quenching of coke in said cavity.

3,869,353

PROCESS FOR REGENERATING CONTAMINATED PERCHLORCETHYLENE

Ernst Schubert, Gunzburg, Danube, Germany, assignor to Chemische Fabrik Richard Geiss, Danube, Lusshof, Germany

Filed Dec. 10, 1973, Ser. No. 423,502

Claims priority, application Germany, Feb. 28, 1973, 2309997

Int. Cl. B01d *3/34*; **C07c** *21/04*

U.S. Cl. 203—38 **9 Claims**

1. A process for regenerating contaminated perchloroethylene, comprising the step of subjecting the contaminated perchloroethylene to a distillation operation to form a perchloroethylene distillate after the addition of about 0.01 to 1.0 percent of an organic peroxygen compound which is readily soluble in perchloroethylene and does not cause decomposition of the perchloroethylene under distilling conditions; said organic peroxygen compound decomposing at a temperature of between 30° and 120°C, and boiling together with its by-products at a temperature above 121°C and not forming an azeotropic distillate with perchloroethylene.

3,869,354

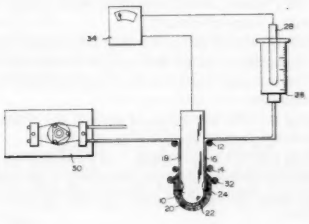
AMMONIUM ION SPECIFIC ELECTRODE AND METHOD THEREWITH

Joseph G. Montalvo, Jr., New Orleans, La., assignor to The Unites States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Apr. 6, 1973, Ser. No. 348,673

Int. Cl. G01n *27/30*, *27/46*, *3/14*

U.S. Cl. 204—1 T **10 Claims**



1. An ammonium ion specific electrode, comprising:

a monovalent cationic electrode having an active surface portion thereon sensitive to ammonium ion;

an ammonia permeable, cation impermeable membrane surrounding the active surface of said electrode; and

a layer of electrolyte between said membrane and said electrode, said electrolyte being buffered to maintain a constant pH therein as ammonia diffuses thereinto.

9. An apparatus for selectively detecting ammonium ion in the presence of interfering cations comprising:

an ammonium ion specific electrode in accordance with claim **1**;

a reference electrode in contact with said buffer-electrolyte layer; and

a potentiometer means for measuring the potential difference between said ammonium ion specific electrode and said reference electrode.

10. A method for selectively detecting ammonium ion in the presence of interfering cations comprising:

placing the apparatus of claim **9** into a solution to be tested; and

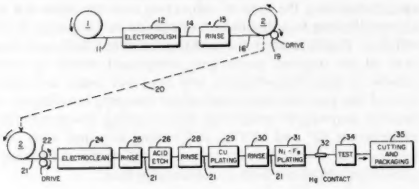
buffering the test solution to a pH more basic than the pH of said buffer-electrolyte,

whereby the presence of ammonium ion will be selectively detected by said apparatus to a high sensitivity and will appear on said potentiometer.

3,869,355
METHOD FOR MAKING A MAGNETIC WIRE OF IRON AND NICKEL ON A COPPER BASE

Joseph S. Mathias, Riverton, N.J., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 689,042, Dec. 8, 1967, abandoned, which is a division of Ser. No. 443,399, March 29, 1965, Pat. No. 3,370,929. This application May 1, 1970, Ser. No. 31,866
Int. Cl. C23b *5/50, 5/58, 3/06*
U.S. Cl. 204—32 R **11 Claims**



1. The method of making a plated-wire memory element haivng an information-storing magnetic film covering a wire-like non-magnetic wire strand which comprises the steps of:

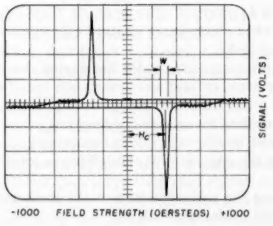
a. producing a relatively smooth and clean surfaced non-magnetic wire strand;
b. electroplating a controlled rough non-magnetic metallic surface on said non-magnetic wire strand using a copper cyanide electrolyte with a plating current of about 15–100 milliamperes;
c. electroplating on said controlled rough surface a magnetic film having a ratio of about 80% nickel and 20% iron with a trace of cobalt;
d. the plating current utilized during the second- mentioned step producing a controlled surface roughness, which is effective to control at least the coercive force, H_c, of the magnetic film;
e. carrying out the third-named step in the presence of a bias current flowing in said wire strand; and
f. said bias current establishing a circumferential easy axis of magneitzation in the magnetic coating on said wire,

said magnetic film having a non-destructive read-out characteristic.

3,869,356
METHOD OF MAKING A THIN, FLEXIBLE MAGNETIC MEMORY LAYER

Kenneth E. Long, Cleveland Heights, Ohio, and David W. Taylor, Edgemont, Pa., assignors to Nico Magnetics Inc., Wilmington, Del.

Filed July 5, 1973, Ser. No. 376,855
Int. Cl. C23f *17/00;* **C23b** *5/08*
U.S. Cl. 204—38 R **14 Claims**



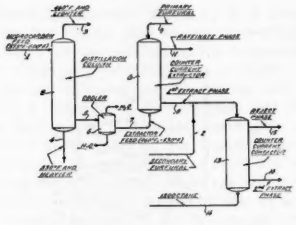
1. Method of producing an electromagnetic tape comprising:

a. coating a surface of a thin film substrate with a smooth layer of a copolymer of acrylonitrile and vinylidine chloride and containing gold,
b. thereafter chemically depositing a layer of copper upon said smooth layer from an electroless plating bath containing copper formate as the source of copper ions,
c. electrodepositing a layer of cobalt on top of the copper from a plating bath containing cobalt ions and buffered in a pH range of between about 3.6 and 5.8 with a low molecular weight substituted or unsubstituted carboxylic or dicarboxylic acid, and
d. applying a protective coating over the layer of cobalt.

3,869,357
PURIFICATION OF ALKYL NAPHTHALENES BY DISTILLATION AND FURFURAL EXTRACTION

Wesley R. Cherry, Prospect Park, Del., and Kenneth A. Scott, Swarthmore, Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation of Ser. No. 214,317, Dec. 30, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 428,285
Int. Cl. B01d *3/34;* **C07c** *7/00*
U.S. Cl. 203—43 **8 Claims**



1. Process for separating mono and dimethylnaphthalene from a hydrocarbon feed comprising alkylnaphthalenes including methylnaphthalenes and dimethylnaphthalenes and non-naphthalenes including monocyclic hydrocarbons and non-aromatic hydrocarbons, said feed boiling in the range from 375°–600°F. and containing 25–97% aromatics and over 25% alkylnaphthalenes which comprises:

a. distilling said hydrocarbon feed in a distillation zone;
b. withdrawing from said distillation zone a hydrocarbon fraction boiling mainly in the range of 460°–530°F;
c. countercurrently extracting said hydrocarbon fraction boiling mainly in the range of 460°–530°F. comprising alkylnaphthalenes, monocyclic aromatics, tricyclic aromatics and non-aromatic hydrocarbons with furfural solvent at a temperature in the range of 10° to 150°F., the ratio of furfural to the total aromatics in the charge fraction being in the range of 0.75:1 to 7:1 by volume;
d. separating an extract phase from a raffinate phase;
e. countercurrently contacting the extract phase at a temperature in the range of 10° to 150°F. with saturated hydrocarbon of the C_5–C_8 range in amount of 0.5 to 2.0 volumes of said saturated hydrocarbon per volume of extract in the extract phase, whereby said saturated hydrocarbon mainly dissolves in the diluted extract phase and displaces therefrom non-aromatic hydrocarbons and a minor amount of the monocyclic aromatics to form a reject phase containing displaced non-aromatics, monocyclic aromatics and only a minor proportion of said saturated hydrocarbon;
f. removing the reject phase
g. removing the furfural phase containing most of the mono and dimethyl naphthalenes and most of the C_5–C_8 saturated hydrocarbon; and
h. separating the mono and dimethylnaphthalene concentrate of higher than 95% purity from said furfural phase.

3,869,358
ELECTROLYTES FOR THE ELECTROLYTIC DEPOSITION OF ZINC

Fred I. Nobel, and Barnet D. Ostrow, both of Roslyn, N.Y., assignors to Lea-Ronal, Inc., Freeport, N.Y.

Continuation of Ser. No. 268,920, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 17,302, March 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 640,339, May 22, 1967, abandoned. This application Nov. 5, 1973, Ser. No. 412,817

Int. Cl. C23b *5/46*

U.S. Cl. 204—55 Y **10 Claims**

1. An aqueous alkaline zincate bath suitable for depositing bright metallic zinc deposits and containing less than about 2 oz./gal. of cyanide therein, said bath comprising an aqueous alkaline solution having dissolved therein:

a. a soluble zinc compound capable of being plated by electroytic deposition; and

b. at least about 0.1 gm./l of a water soluble polymer containing repeating tertiary and/or quaternary amine groups, said polymers having been prepared by (i) polymerizing an aliphatic amine with an epihalohydrin, said polymerization being carried out for a sufficient length of time, and said reactants being present in such a molar ratio, so as to produce a polycondensate having repeating tertiary and/or quaternary amine groups ahd having a molecular weight above about 250 but below that which would render the polycondensate water insoluble or insoluble in the alkaline zincate bath.

3,869,359
METHOD OF MAKING INTIMATELY ADMIXED METAL OXIDES

Henri Bernard Beer, Heide-Kalmthout, Belgium, assignor to A.G. fur Oxydenchemie, Vaduz, Liechtenstein

Filed June 25, 1973, Ser. No. 373,296

Int. Cl. C01b *13/14*

U.S. Cl. 204—96 **23 Claims**

1. A method of making intimately admixed metal oxides, comprising placing into an electrolyte a pair of electrodes the anode of which is a metal electrode the metal of which is to form one of the intimately admixed metal oxides and which metal will form a hydroxide of said metal upon electrolysis of said electrolyte, adding to the electrolyte a poorly soluble compound of at least one second metal which is to form the other of the intimately admixed metal oxides, providing in said electrolyte a source of oxygen, carrying out electrolysis of said electrolyte by means of said electrodes while agitating the electrolyte, and recovering the precipitated intimately admixed oxides of the metal of the electrode and the metal of the compound.

3,869,360
REDUCTION METHOD FOR SEPARATING METAL VALUES FROM OCEAN FLOOR NODULE ORE

William S. Kane, Wicomico, Va. 23184, and Paul H. Cardwell, Zanoni, Va. 23191

Continuation-in-part of Ser. No. 251,089, May 8, 1972, abandoned, which is a continuation of Ser. No. 40,586, May 26, 1970, abandoned. This application Nov. 29, 1972, Ser. No. 310,604

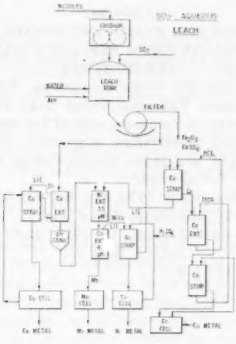
Int. Cl. C22d *1/24, 1/14, 1/16*

U.S. Cl. 204—105 R **14 Claims**

1. A process for separating metal values from ocean floor nodule ores, the ore comprising as primary components the oxides of manganese and iron and as secondary components compounds of copper, cobalt and nickel, the process comprising the steps of:

1. reacting the nodule ore, in the presence of oxygen, with a sulfur dioxide acidic reducing agent to form as reaction products the water-soluble sulfates of divalent manganese, nickel, cobalt and copper (2) contacting the metal values with sufficient oxygen to convert substantially all of the iron present to insoluble iron oxide. (3) leaching the reacted ore with an aqueous leach liquid to form an aqueous pregnant leach solution comprising the water-soluble salts of divalent manganese, copper, nickel and cobalt;

(4) separating the solution from any insoluble residue of the ore;



(5) separating out an individual metal value by treating the aqueous solution in a liquid ion exchange process to form a solution of the individual metal in the form of a water-soluble salt;

(6) reducing the metal value to the elemental metal by cathodically electroplating from the solution of the water-soluble salt.

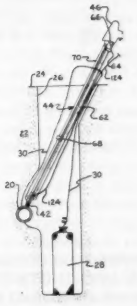
3,869,361
METHOD FOR MAKING AN ELECTRICALLY-CONDUCTIVE CONNECTION SPECIFICALLY FOR UNDERGROUND LINES

John C. Jenkins, Lorain, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 26, 1972, Ser. No. 318,191

Int. Cl. C23f *13/00;* **B23k** *11/04;* **H02g** *15/08*

U.S. Cl. 204—148 **7 Claims**



1. A method of connecting an electrically conductive wire to an external surface of an underground metal pipe, said method comprising forming a hole from the surface of the ground above the pipe down to a location near the pipe so that a portion of the surface of the pipe is exposed to the surface of the ground, affixing an electrically conductive wire to a

weldable stud at a portion spaced from a weldable end thereof, and subsequently welding the weldable end of said stud to said portion of the surface of said pipe by placing the stud in a chuck of a stud welding tool, holding the tool above the surface of the ground, inserting the stud and the chuck into the hole and contacting the pipe with the weldable end of the stud, and initiating a welding cycle for the stud welding tool.

3,869,362

PROCESS FOR REMOVING NOXIOUS GAS POLLUTANTS FROM EFFLUENT GASES BY IRRADIATION

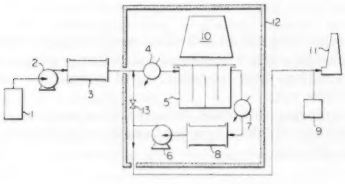
Sueo Machi, Takasaki; Keita Kawamura, Yokohama; Waichiro Kawakami, Takasaki; Shingi Aoki, Fujisawa; Shoji Hashimoto; Keiichi Yotumoto, both of Takasaki, and Hiromi Sunaga, Isesaki, all of Japan, assignors to Ebara Manufacturing Co., Ltd. and Japan Atomic Energy Research Institute, both of Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 431,925

Claims priority, application Japan, Jan. 11, 1973, 48-5607; Jan. 19, 1973, 48-7827; Aug. 15, 1973, 48-91547

Int. Cl. B01j *1/10*

U.S. Cl. 204—157.1 R **9 Claims**



1. A process for removing NOx and SO_2 from effluent gases comprising

regulating the ratio of the NOx content to the SO_2 content so as to be in the region of 0.1 - 3.0 before the gases are delivered to a reaction chamber inlet,

moving said gases through said reaction chamber and at the same time irradiating them with an ionizing radiation or ultraviolet light from a radiation source which is placed near or in said reaction chamber, thereby converting gaseous pollutants including NOx and SO_2, to mist and/or solid particles, and then

collecting the particles thus produced by a mist and dust collector.

3,869,363

GENERATION OF PHOTOFLUORESCENT MATERIALS BY SHORT WAVELENGTH ULTRAVIOLET IRRADIATION OF NON-FLUORESCENT BIS-DIARYLCHLOROMETHYL-1,3,4-OXADIAZOLES

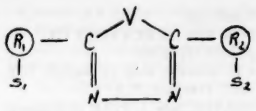
Balwant Singh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 13, 1973, Ser. No. 424,268

Int. Cl. B01j *1/10*; **G01n** *21/00*

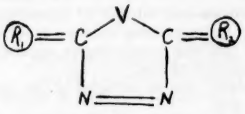
U.S. Cl. 204—158 R **10 Claims**

1. A method for the transcription of expressions to a member incorporating a cyclic azo compound of the formula:



(non-luminescent)

by directed photochemical short-wavelength light generation of a fluorescent cyclic azo compound, in situ, of the formula:



(luminescent)

which fluorescent transcription is made discoverable by longer wavelength radiation; wherein R_1 and R_2 represent a symmetrical bis aromatic methyl or polycyclic aromatic radical remnant and S_1 and S_2 respectively represent sublating substituents chlorine, bromine or $-CO_3BU^t$ and V represents oxygen, sulfur or N-Z where N represents nitrogen and Z represents lower alkyl, alkaryl or aryl.

3,869,364

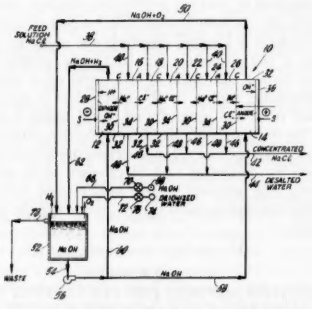
SYSTEM FOR INHIBITING ATTACK ON A FERROUS ANODE ELECTRODE IN AN ELECTRODIALYTIC CELL

Alvaro R. Tejeda, New York, N.Y., assignor to J. Vast Associates Inc., New York, N.Y.

Filed Jan. 5, 1973, Ser. No. 321,333

Int. Cl. B01k *5/00*

U.S. Cl. 204—301 **4 Claims**



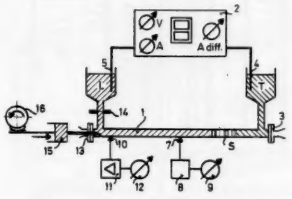
1. An electrodialytic apparatus for the treatment of electrolytic fluids, said apparatus comprising several serially disposed compartments including a first end compartment having a ferrous cathode electrode disposed therein, a second end compartment spaced from said first end compartment, said second end compartment having a ferrous anode electrode disposed therein, plural intermediate compartments between said first end compartment and said second end compartment, ion permselective membranes separating each compartment from the compartments immediately adjacent thereto, means for introducing into and removing electrolytic fluid from all the intermediate compartments, means for impressing a direct electric current across said cathode and said anode electrodes, and means for continuously introducing into and removing an aqueous caustic solution from said end compartments.

3,869,365

METHOD IN COUNTER FLOW ISOTACHOPHORESIS

Bengt Fritiof Sunden, Alvsjo, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Dec. 12, 1973, Ser. No. 423,997
Claims priority, application Sweden, Dec. 19, 1972, 16594/72
Int. Cl. B01k 5/00
U.S. Cl. 204—180 R 8 Claims



1. Method in counter flow isotachophoresis of the type wherein a sample comprising ions of the same polarity to be separated is introduced into a column provided with first and second electrodes, with a first electrolyte between the sample and said first electrode and a second electrolyte between the sample ans said second electrode, the first and second electrolytes comprising ions of higher and lower mobilities respectively than the ions of the sample and an electrical potential is applied between said first and second electrodes having a polarity such that the sample ions will tend to migrate towards said first electrode and a pressure difference is applied between said first and second electrolytes, the improvement which includes the steps of:

independently adjusting the value of said electrical potential and the value of said pressure difference to produce with the aid of a current differential detector an electrical current flow having a constant value such that the influence of said constant current flow equalizes the adjusted opposing counter flow of electrolyte to maintain the sample at a desired position in the column.

3,869,366

METHOD FOR ELECTROCOATING

Tameyuki Suzuki, Zushi; Junichi Yasukawa, Chigasaki; Teruhiko Ishii, Chiba; Giiichi Minami, Kobe; Yukihiro Manabe, Amagasaki, and Mitsuo Nishimura, Nishinomiya, all of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki, Japan

Filed Sept. 29, 1972, Ser. No. 293,545
Claims priority, application Japan, Oct. 6, 1971, 46-79076
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 13 Claims

1. A method of electrocoating which comprises immersing an electrically conductive metallic article as a cathode in an aqueous electrodeposition bath containing a cationic binder resin and a non-ionic synthetic resin powder dispersed therein, the amount of the latter being 100 – 5000 parts by weight per 100 parts of the former, applying a voltage between said cathodic article and an anode to cause electric current flow through said bath so that a resinous coating comprising said binder resin and non-ionic resin powder is electrodeposited on the cathodic article, taking the coated article out of the bath and baking the same to form an adherent resinous film on said article.

3,869,367

PROCESS FOR MANUFACTURING A CONDUCTIVE FILM FOR A THIN FILM INTEGRATED CIRCUIT DEVICE

Akio Sato, and Shigehiko Sato, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Jan. 3, 1973, Ser. No. 320,706
Claims priority, application Japan, Dec. 27, 1972, 47-130072
Int. Cl. C23c 15/00
U.S. Cl. 204—192 3 Claims

1. A process for manufacturing a highly conductive thin film for use in thin film integrated circuits comprising the steps of: forming a film of a first high-conductivity metal on an insulator base plate;

forming a diffusion preventing insulator film on said metal film; and

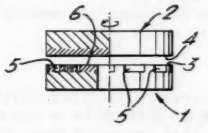
sputtering a second metal susceptible to anodic film forming oxidation onto said insulator film, said insulator film being of such a thickness as to permit particles of said second metal to penetrate said insulator film at a multiplicity of locations, while leaving intact a sufficient insulating film to substantially prevent the formation of an alloy of said first and second metals, whereby a composite film is produced having a specific conductivity higher than that of either of said first or said second metals.

3,869,368

METHODS OF SPUTTER DEPOSITION OF MATERIALS

Geoffrey Beardmore, Cheltenham, and Hugh N. Evans, Bristol, both of England, assignors to Smiths Industries Limited, London, England

Continuation of Ser. No. 786,892, Dec. 26, 1968, abandoned.
This application July 8, 1971, Ser. No. 160,913
Claims priority, application Great Britain, Dec. 29, 1967, 59139/67
Int. Cl. C23c 15/00
U.S. Cl. 204—192 2 Claims



1. In a method of sputter deposition of a particular material from a target onto a surface of a substrate to form thereon a projection from said surface comprising the steps of:

A. Applying a negative potential to said substrate so as to sputter substrate material from the surface thereof,

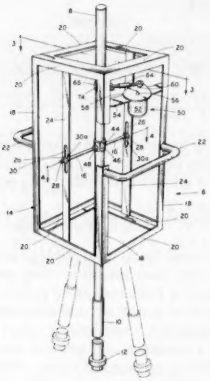
B. Thereafter applying a negative voltage to a target formed of said particular material which voltage increases in amplitude while concurrently the voltage applied to the substrate is decreased to thereby increase the rate of sputtering from the target progressively from zero while concurrently the rate of sputtering from the substrate decreases progressively to zero,

C. And thereafter continuing to apply said negative voltage to the target to sputter therefrom onto the substrate while the voltage on the substrate is maintained at substantially zero voltage until the desired amount of target material is deposited on the substrate in accordance with the desired thickness of the projection.

3,869,369
VIBRATING OXYGEN PROBE

Yi-Chung Chang, Murrysville; Nicholas M. Rymarchyk, and Robert B. Greenstine, both of Pittsburgh, all of Pa., assignors to Berry Metal Company, Harmony, Pa.

Filed Jan. 26, 1973, Ser. No. 326,904
Int. Cl. G01n *27/46*; **C21c** *7/00*
U.S. Cl. 204—195 S **10 Claims**



1. An apparatus for measuring the oxygen content of molten metal, comprising:

an elongated lance having an upper portion and a lower portion having an oxygen probe at its lower end, said oxygen probe having a solid electrolyte for measuring the oxygen concentration in the molten metal,

a mounting frame supporting the lance upper portion and including trunnion means pivotally mounting the upper lance portion on the frame,

drive cam means on the frame and operatively connected with the lance upper portion in vertically spaced relation from the trunnion means for imparting periodic movement to the oxygen probe, and

a motor means carried by the frame and drivingly connected with said cam means to provide for said periodic movement of the oxygen probe.

3,869,370
METHOD AND APPARATUS FOR CONTINUOUSLY SENSING THE CONDITION OF A GAS STREAM

Donald A. Sayles, 1337 Beechwood Blvd., Pittsburgh, Pa. 15217

Filed May 7, 1973, Ser. No. 357,627
Int. Cl. G01n *31/00*; **B01k** *3/00*
U.S. Cl. 204—195 S **5 Claims**

1. Apparatus for continuously sensing the condition of a gas flowing in a main passageway comprising,

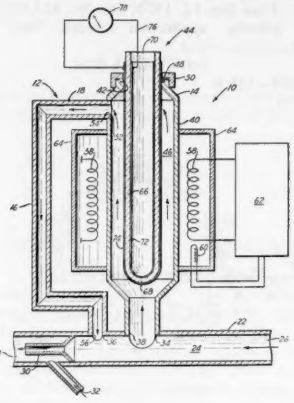
a sample gas flow conduit having an inlet opening and an outlet opening connected to spaced openings in the main passageway,

said sample gas flow conduit having a gas inlet leg extending upwardly at an angle to the earth's surface and a gas outlet leg extending downwardly at an angle to the earth's surface, said gas inlet leg and said gas outlet leg arranged in spaced relation to each other and operable to provide a difference in static head therebetween,

means to heat said gas inlet leg and maintain a temperature differential between said gas inlet leg and said gas outlet leg so that a sample stream of gas is withdrawn from said gas flowing in said main passageway by convection and at a preselected flow rate,

said gas inlet leg includes an enlarged portion, and

a ceramic oxide electrolyte electrochemical cell positioned in said enlarged portion of said gas inlet leg of said gas

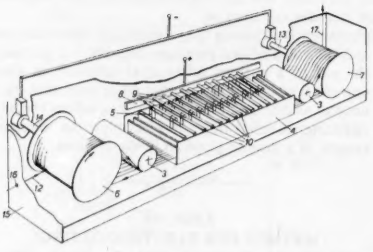


flow conduit to measure the oxygen partial pressure of said stream of gas flowing through said sample gas flow conduit.

3,869,371
ELECTROTINNING WIRE

James Delves-Broughton, Mathern, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 23, 1973, Ser. No. 381,954
Int. Cl. C23b *5/68*, *5/58*, *5/14*
U.S. Cl. 204—206 **6 Claims**



1. Apparatus for continuously depositing a metal coating on a longitudinally moving wire comprising a housing, a tank in said housing for a bath containing an electrolyte including a salt of the metal to be deposited, means for passing said wire a plurality of times through said bath and end walls of said tank, said means including a pair of rotatable electrically conducting drums respectively positioned within said housing at opposite ends outside of said tank directing said wire into a plurality of loops, direct current supply means, at least one of said drums being connected to the negative terminal of said supply means, a pair of grooved rollers positioned respectively between said opposite ends of said tank and said drums to cause the portions of said wire loops passing through said bath to be in a substantially common horizontal plane with alternate wires moving in opposite directions, and a plurality of anodes positioned along said tank in said bath and connected to the positive terminal of said supply means, said anodes being of the metal to be deposited, said housing collecting electrolyte escaping from said tank and providing a source of electrolyte for said tank.

3,869,372
ELECTROPLATING OF THE CUT EDGES OF SHEET METAL PANELS

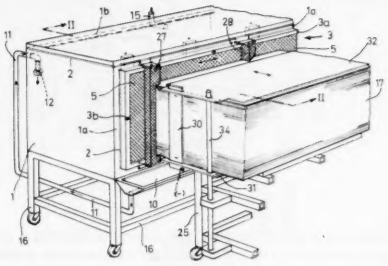
Otto Alfred Becker, 59 Robert Koch Strasse, T-6600 6 Saarbrucken, Germany

Division of Ser. No. 835,116, June 20, 1969, abandoned. This application Dec. 2, 1971, Ser. No. 204,385

Claims priority, application Germany, June 20, 1968, 1771645; Aug. 1, 1968, 1771933; Oct. 17, 1968, 1803474

Int. Cl. C23b *5/68*

U.S. Cl. 204—224 R **13 Claims**



1. Apparatus for electroplating the cut edges of sheet metal panels comprising:

a. a container for the electrolyte, a lid for the container, and means for retaining said lid air tight on said container;

b. means separate from said container for supporting a stack of said sheet metal panels and substantially aligning the edge portions of said panels on at least one side thereof;

c. at least one anode mounted in said container;

d. means for directly electrically contacting each sheet metal panel for connecting the same to the cathode of a direct current source, and

e. means for conducting current to said contacting means whereby said cut edges are electroplated.

3,869,373
CONTACT DEVICE FOR ELECTROCHEMICALLY DEBURRING WORKPIECES

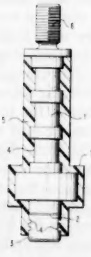
Hans-Dieter Schacher, Bernhausen; Reinhold Fischer, Burgstetten, and Matthias Kunst, Hohenacker, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed May 11, 1973, Ser. No. 359,416

Claims priority, application Germany, May 12, 1972, 2223152

Int. Cl. B23p *1/02*; **C23b** *5/68*; **B01k** *3/00*

U.S. Cl. 204—224 M **7 Claims**



1. In a device for the electrochemical deburring of workpieces that are to be connected as anodes which includes a shaped tool electrode serving as cathode and adapted to contain an electrolyte flowing between anode and cathode, wherein the supply of energy to the workpiece takes place via an anode contact means surrounded with an insulating material except for an electrical current cable connection at one end and a contact surface at the other end, the improvement which comprises said anode contact means including a contact body means made of a metal consisting essentially of tungsten for providing said contact surface and a contact carrier means frictionally welded to said contact body means and made of a metal consisting of a copper-chrome alloy, and said insulating material forms a casing for the contact body means and the contact carrier means, at least one of said contact body means and said contact carrier means being provided with circumferentially extending grooves at least at places corresponding to an end of the insulating casing adjacent to an end of the anode contact means, said casing engaging in said grooves.

3,869,374
COUNTERCURRENT EXTRACTION COLUMN FOR LIQUID-LIQUID EXTRACTION AND SIMULTANEOUS ELECTROLYSIS

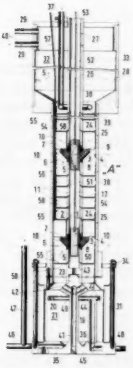
Hubert Goldacker, Karlsruhe; Helmut Hausberger, Bad Langenbrucken, and Helmut Schmieder, Karlsruhe, all of Germany, assignors to Gesellschaft fur Kernforshung mbH, Karlsruhe, Germany

Filed Mar. 23, 1973, Ser. No. 344,151

Claims priority, application Germany, Dec. 13, 1972, 2261018

Int. Cl. B01k *3/00*

U.S. Cl. 204—273 **21 Claims**



1. A countercurrent extraction column for carrying out a liquid-liquid extraction of two phases which are insoluble in each other, one of which phases is a conducting phase and the other of which is a non-conducting phase with the use of simultaneous electrolysis, the column comprising, in combination:

a. means forming an upright column having a longitudinal axis;

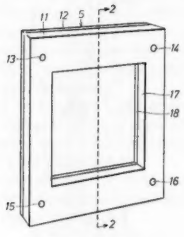
b. an upright tube within said column, said tube extending in the direction of said column and dividing a portion of the same into inner and outer compartments through which may flow, in countercurrent, said two phases, one of said compartments being an anode compartment and the other of said compartments being a cathode compartment; said tube including at least one tube section separating said cathode compartment and said anode compartment;

c. an anode in said anode compartment;
d. a cathode in said cathode compartment; and
e. communicating means establishing communication through said tube between said two compartments, said communicating means defining orifices situated in one of the compartments each orifice being oriented in a direction having a component parallel to said axis, the directional components all pointing in the same sense; said communicating means including a nozzle means terminating in said orifices, each orifice having a cross section, the plane of which intersects said axis; said nozzle means including an annular member surrounding said tube section, said annular member defining an annular space between said anode compartment and said cathode compartment, said annular member having outer openings in its upper surface, which outer openings open into said cathode compartment and form said orifices; said outer openings being positioned on concentric circles around the center axis of said column and having outwardly increasing diameters; and inner openings in its inner surface, which inner openings open into said anode compartment and include bores inclined upward in said tube.

3,869,375
GASKET STRUCTURE

Hiroshi Ono, and Mitsuo Yoshida, both of Noveoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1971, Ser. No. 211,359
Claims priority, application Japan, Dec. 23, 1970, 45-117140
Int. Cl. B01d *13/02*
U.S. Cl. 204—301 **3 Claims**

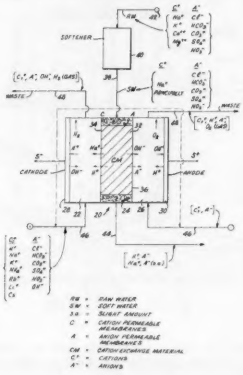


1. A gasket structure for preventing leaks, said gasket structure comprising at least three gasket substructures, at least two of said substructures each including a first sheet of hard material and a second sheet of soft material wherein said sheet of soft material is thinner than said sheet of hard material and wherein said first and second sheets have a central opening and guide passages formed therein; said at least two gasket substructures being held together by pressure sufficient to compress said soft sheets without substantially compressing said hard sheets whereby leaks are prevented and said central opening and guide passages are not deformed and said third gasket substructure includes a sheet of soft resilient material and guide wall members of hard, resilient material said third gasket substructure having a central opening and guide passages corresponding to said central opening and guide passages formed by said at least two gasket substructures wherein said guide wall members are positioned within the central opening of said soft sheet and at least one of the guide passages of said third gasket substructures commuincates with said central opening.

3,869,376
SYSTEM FOR DEMINERALIZING WATER BY ELECTRODIALYSIS

Alvaro R. Tejeda, New York, N.Y.

Filed May 14, 1973, Ser. No. 359,702
Int. Cl. B01k *5/00*
U.S. Cl. 204—301 **4 Claims**

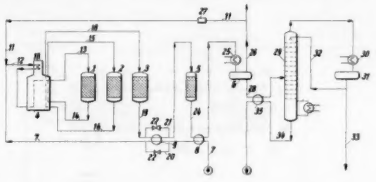


1. An electrodialytic apparatus for the treatment of soft water, said apparatus comprising at least nine serially disposed compartments including a first compartment having a ferrous cathode electrode disposed therein, a second compartment immediately adjacent said first compartment and separated therefrom by a cation permselective membrane, a bed of cation exchange material disposed within said second compartment, a third compartment immediately adjacent said second compartment and separated therefrom by an anion permselective membrane, a fourth compartment immediately adjacent said third compartment and separated therefrom by a cation permselective membrane, a bed of anion exchange material disposed within said fourth compartment, a fifth compartment immediately adjacent said fourth compartment and separated therefrom by an anion permselective membrane, a sixth compartment immediately adjacent said fifth compartment and separated therefrom by a cation permselective membrane, a bed of anion exchange material disposed within said sixth compartment, a seventh compartment immediately adjacent said sixth compartment and separated therefrom by an anion permselective membrane, an eighth compartment immediately adjacent said seventh compartment and separated therefrom by a cation permselective membrane, a bed of cation exchange material disposed within said eighth compartment, a ninth compartment immediately adjacent said eighth compartment and separated therefrom by an anion permselective membrane, said ninth compartment having a ferrous anode electrode disposed therein, means for introducing soft water into the second, third, fifth, sixth and seventh compartments, means for removing fluid from the second, third, fifth, sixth and seventh compartments, means for introducing fluid removed from the second compartment into the fourth compartment, means for introducing fluid removed from the sixth compartment into the eighth compartment, means for removing fluid from the third, fifth and seventh compartments and leading the same to a treatment means, means for removing fluid from the fourth and eighth compartments, combining the same and leading the combined fluids to an outlet for use, and means for impressing a direct electric current across said cathode and anode electrodes whereby the fluid leaving the fourth compartment is deionized water at an alkaline pH, the fluid leaving the eighth compartment is deionized water at an acidic pH, and the combined fluids comprise deionized water at a substantially neutral pH.

3,869,377
PRODUCTION OF EXTRAPURE AROMATICS

Karl-Heinz Eisenlohr, Buchschlag; Helmut Markwort, and Berthold Scholz, both of Weisskirchen, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Maine, Germany

Filed Dec. 13, 1972, Ser. No. 314,636
Claims priority, application Germany, Dec. 14, 1971, 2161973
Int. Cl. C10g *39/00*
U.S. Cl. 208—66 **11 Claims**

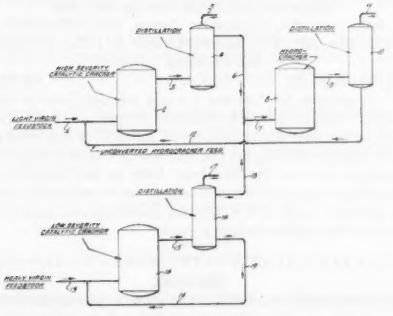


1. In a process for producing substantially pure aromatics whereins a gaseous reaction mixture which contains hydrogen, olefins, diolefins and aromatic compounds is subjected to a hydroforming operation with a noble metal catalyst at about 500° to 600°C and a pressure of about 15 to 50 atmospheres, and wherein subsequently the aromatics are separated in the substantially pure state from the hydroformate, the improvement which comprises cooling the hydroformate to a temperature of **100** to **400**°C directly after hydroforming and passing it still in gaseous state through a reactor filled with a hydrogenation catalyst comprising cobalt and molybdenum on an inorganic oxide carrier under a lower pressure than the hydroforming operation, whereby the olefins and diolefins are substantially eliminated.

3,869,378
COMBINATION CRACKING PROCESS

Andre W. Pollock, and James M. Durrett, both of West Chester, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Nov. 16, 1971, Ser. No. 173,699
Int. Cl. B01j *9/20*; C10g *37/02*
U.S. Cl. 208—78 **2 Claims**

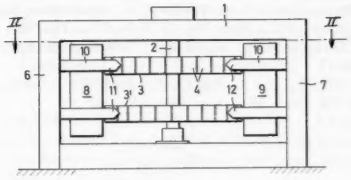


1. A process for treating petroleum which comprises
a. catalytically cracking, in a first cracking zone, a heavy virgin feedstock at a temperature of at least about 900° F.,
b. catalytically cracking, in a second cracking zone, a light virgin feedstock at a severity essentially higher than that in step a,
c. separating in a distillation zone an aromatic cycle oil from the cracked products of steps a and b,
d. catalytically hydrocracking the aromatic cycle oil produced in step c in a hydrocracking zone,
e. separating the bottom fraction boiling above at least about 400° F. from the effluent of step d in a distillation zone, said bottom fraction, being of sufficient paraffin content, that is at least about 70 percent due to the catalytic hydrocracking of step d to comprise an acceptable catalytic cracker feedstock without further processing and
f. recycling said bottom fraction produced in step e to the catalytic cracking zone of step b.

3,869,379
MAGNETIC SEPARATOR

Hans-Jurgen Vorster, Cologne; Paul Kunath, Cologne-Mauenheim, and Karl-Wilhelm Bethmann, Aachen, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Continuation of Ser. No. 129,681, March 31, 1971, abandoned. This application Nov. 2, 1973, Ser. No. 412,168
Int. Cl. B03c *1/14*
U.S. Cl. 209—222 **3 Claims**



1. In a magnetic separator, a stationary frame; a vertical drive shaft rotatably mounted in said frame; at least two rotors secured to said drive shaft one above the other, each of said rotors including a plurality of plate sets of substantially equal length in the circumferential direction of the rotor and uniformly distributed along the periphery thereof, the plate sets of one of said rotors being circumferentially offset in relation to the plate sets of the adjacent rotor by an amount substantially equal to the length of a plate set divided by twice the number of rotors; and pole shoes secured to said frame and having curved surfaces adjacent and substantially conforming in shape to the peripheries of said rotors.

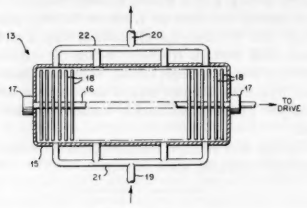
3,869,380
TREATMENT OF WASTEWATER

Wilbur N. Torpey, Douglaston, N.Y., assignor to Autotrol Corporation, Milwaukee, Wis.

Division of Ser. No. 293,594, Sept. 29, 1972, Pat. No. 3,817,857. This application Nov. 14, 1973, Ser. No. 415,677
Int. Cl. C02c *1/04*
U.S. Cl. 210—17 **8 Claims**

1. A method for treating wastewater containing carbonaceous pollutants measured as BOD_5 and ammonia nitrogen in a weight ratio of at least 3.6:1 respectively, comprising the steps of supplying said wastewater at a predetermined rate to a biological treatment unit that includes not more than a single rotatable shaft supporting a plurality of partially submerged biological contactors having surface area for the growth and maintenance of orgnisms, creating a flow of said wastewater through said biological treatment unit in a direction generally perpendicular to said rotatable shaft and rotating said shaft to impart a predetermined peripheral velocity to said biological contactors to alternately expose said surface area to wastewater and an oxygen containing atmosphere, said predetermined rate and peripheral velocity being chosen to simultaneously

oxidize at least about 83 weight percent of said carbonaceous pollutants measured as BOD_5 and at least about 46 weight



percent of said ammonia nitrogen on the same surface area of said contactors.

3,869,381

PROCESS AND APPARATUS FOR CHEMICAL CONDITIONING OF WATER

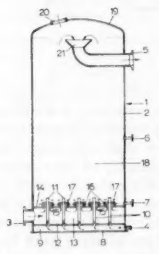
Antonie Graveland, Maarsen; Wouter Louis Prinsen Geerligs, Amstelveen, and Mohamad Ali Arafien Soleman, Amsterdam, all of Netherlands, assignors to Ingenieursbureau Dwars, Heederik en Verhey B.V., Amersfoort, Netherlands

Filed Mar. 28, 1973, Ser. No. 345,760

Claims priority, application Netherlands, Apr. 4, 1972, 720447

Int. Cl. B01d *43/00*

U.S. Cl. 210—20 **17 Claims**



1. A process for chemical conditioning of water containing hardness constituents comprising adding a solution of an alkali metal hydroxide to the water in a reactor with a fluidized granular bed and removing the hardness constituents in granular form, wherein the water and the alkali metal hydroxide solution are separately injected into the reactor in such a manner that the outflow direction of the water forms an angle with the general current direction in the reactor and the alkali metal hydroxide solution discharges above the level of the water discharge openings.

3,869,382

METHOD AND APPARATUS FOR DETERMINING EXHAUSTION OF A MASS OF ION EXCHANGE MATERIAL AND A DEVICE USING THE SAME

Alvaro R. Tejeda, New York, N.Y., assignor to J. Vast Associates, Inc., New York, N.Y.

Filed Jan. 3, 1974, Ser. No. 430,464

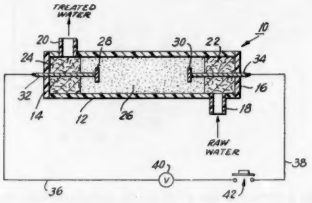
Int. Cl. B01d *15/04*

U.S. Cl. 210—30 **32 Claims**

32. A method for detecting the exhaustion point of a porous mass of ion exchange material extending in a container from an inlet boundary to an outlet boundary and originally wholly being substantially uniformly charged to an original state with desirable ions selected from the group consisting of desirable cations and desirable anions, said method comprising:

A. flowing a liquid to be treated and containing undesirable ions through the mass between the boundaries so as to progressively change the ionic state thereof to a final ionic state while exchanging desirable ions on the material for undesirable ions in the liquid,

B. providing electrodes spaced from one another in the direction of flow of the liquid and with at least a portion of said material therebetween so that said mass between said electrodes in the presence of said liquid constitutes a battery wholly disposed within the container,



C. an electric potential of one value being generated solely by said battery between the electrodes when the liquid in the upstream portion of the material is in an ionic state differing from the ionic state of the liquid in the downstream portion of the material while the downstream portion of the material still is in its original state,

D. an electric potential of a different value being generated solely by said battery between the electrodes when the downstream portion of the material approaches its final state, and

E. observing the electrical values of said potentials and by determining when the potential of different value is generated that the material is substantially exhausted so as to need regeneration or replacement thereof.

3,869,383

PROCESS FOR TREATING WASTE PHOTOGRAPHIC PROCESSING SOLUTIONS

Isao Shimamura, and Haruhiko Iwano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1972, Ser. No. 307,265

Claims priority, application Japan, Nov. 17, 1971, 46-92115; Dec. 30, 1971, 46-63472; Mar. 6, 1972, 47-22907

Int. Cl. B01d *15/06*

U.S. Cl. 210—32 **18 Claims**

1. A process for treating a waste solution from a photographic treatment which solution contains at least one of ferricyanide and ferrocyanide ions comprising contacting the waste solution having a pH of 7 to 9 with a weakly basic anion exchange resin in the free base form in the presence of a buffering compound added in an amount to maintain a buffering action at a pH of 7–9, thereby adsorbing said ions on said weakly basic anion exchange resin.

3,869,384

TAILINGS DISPOSAL SYSTEM FOR TAR SANDS PLANT

Robert Schutte, Sherwood Park, Alberta, Calif., assignor to Canada-Cities Service Ltd.; Imperial Oil Limited; Atlantic Richfield Canada Ltd. and Gulf Oil Canada Limited

Filed Jan. 21, 1974, Ser. No. 435,226

Int. Cl. B01d *21/00*

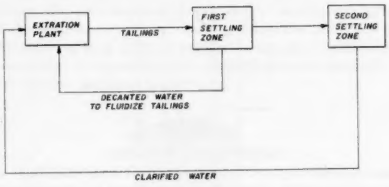
U.S. Cl. 210—44 **2 Claims**

1. In the process of extracting bitumen from tar sand wherein the tar sand is combined with hot water and subjected to flotation to produce separate froth and tailings streams, said

tailings stream comprising coarse solids particles and fine solids particles, the improvement which comprises:

providing first and second settling zones separate from each other and located adjacent the process plant;

pumping the tailings stream into the first settling zone to settle out the coarse solids particles and form a beach, thereby trapping a portion of the tailings water and suspended fine solids particles in the void spaces in the



beach and producing decanted water containing suspended fine solids particles;

withdrawing a portion of the decanted water and combining it with the tailings stream, leaving the flotation operation, to dilute it and render it pumpable whereby it may be pumped to the first settling zone; and

withdrawing a second portion of the decanted water and transferring it to the second zone for settling of suspended fine solids particles.

3,869,385

PROCESS FOR CONTAINING OIL SPILLS

William L. Stanley, Richmond, and Allen G. Pittman, El Cerrito, both of Calif., assignors to The Unites States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 18, 1971, Ser. No. 190,320
Int. Cl. C02b *9/02*
U.S. Cl. 210—53 **8 Claims**

1. A process for containing an oil spill on a body of water, which comprises

applying to the oil spill a polyisocyanate and a polyamine, in such amounts as to furnish free isocyanate groups in approximately equimolar proportion to amino groups, and

wherein both the polyisocyanate and the polyamine have a density less than that of the water in said body and are at least partially miscible with oil but essentially immiscible with water.

3,869,386

REMOVAL OF HEAVY METAL IONS FROM PLATING WASTES

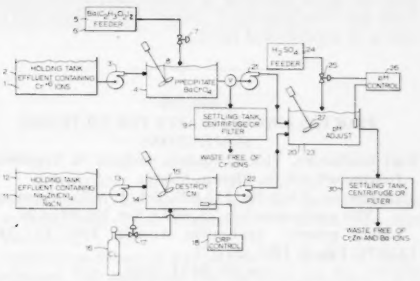
Wladyslaw Izdebski, San Mateo, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Oct. 24, 1972, Ser. No. 300,133
Int. Cl. C02c *5/02*
U.S. Cl. 210—53 **14 Claims**

1. A process for treating plating plant effluent containing hexavalent chromium ions to remove the chromium ions comprising

adding thereto barium acetate in an amount sufficient to precipitate substantially all of the hexavalent chromium ions as barium chromate and

separating the barium chromate precipitate from the solu-


HOLDING TANK EFFLUENT CONTAINING Cr+6 IONS
PRECIPITATE BaCrO4
SETTLING TANK CENTRIFUGE OR FILTER
WASTE FREE OF Cr+ IONS
DESTRUCTION
HOLDING TANK EFFLUENT CONTAINING NaN3 OR NaCNO
SETTLING TANK CENTRIFUGE OR FILTER
WASTE FREE OF Cr, Zn AND Ba IONS

tion, to provide a solution from which the chromium ions have been quantitatively removed.

3,869,387

PROCESS FOR THE EXTRACTION OF PHENOL FROM WASTE WATERS IN THE FORM OF UREA-FORMALDEHYDE-PHENOL CONDENSATES

Silvio Vargiu; Sesto S. Giovanni; Giorgio Mazzoleni, all of Milan, and Silvestro Pezzoli, Biassono, all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed June 12, 1973, Ser. No. 369,345
Claims priority, application Italy, June 13, 1972, 25583/72
Int. Cl. C02b *1/18*
U.S. Cl. 210—54 **3 Claims**

1. Process for the extraction of phenol from waste water in the form of urea-formaldehyde-phenol condensates, characterized in that

a. formahldehyde, urea, and a waste water containing phenol in a concentration of about 0.01 to about 5 wt.% are reacted for about 15 to 60 minutes at temperatures of about 60 to about 95°C and a pH of about 9.5, the molar ratio of formaldehyde to phenol being from 2500 : 1 to about 100 : 1 and that of formaldehyde to urea about 2 : 1 to about 2.7 : 1 to obtain a first reaction product with a viscosity of about 20 to about 35 seconds measured at 25°C in a No. 4 Ford cup,

b. the first reaction product is thereafter kept at temperatures of about 60° to about 95°C and at a pH of about 4.0 to about 5.5 for about 4 to about 10 minutes to obtain a second reaction product with a viscosity of about 35 to about 60 seconds measured at 25°C in a No. 4 Ford cup, the second reaction product is thereafter reacted with additional urea and waste water containing phenol for about 60 to about 240 minutes at temperatures of about 60° to about 95°C and at a pH of about 5.7 to about 6.8, the molar ratio of formaldehyde to phenol being about 2000 : 1 to about 80 : 1 and that of formaldehyde to urea being about 1.40 : 1 to about 1.65 : 1 to obtain a third reaction product with a viscosity of about 75 to about 110 seconds measured at 25°C in a No. 4 Ford cup,

d. the third reaction product is thereafter brought to a pH of about 8 and said urea-formaldehydephenol condensate formed is isolated.

3,869,388

OIL WATER SEPARATION

Richard M. Vennett, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 25, 1973, Ser. No. 373,566
Int. Cl. B01d *12/00*
U.S. Cl. 210—70 **5 Claims**

1. A method for separating and preventing microbial growth between oil and water in storage vessels by adding a liquid inert to and insoluble in both oil and water and having a

specific gravity higher than the specific gravity of said oil and lower than the specific gravity of said water to form a layer between said oil and said water, said liquid being selected from the group consisting of dimethylpolysiloxane silicone fluids and methylphenylpoly siloxane silicone fluids and containing an antimicrobial agent.

3,869,389

PROCESS AND APPARATUS FOR FILTERING SUSPENSIONS

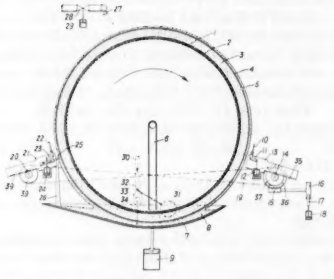
Karl Rokitansky, Vienna, Austria, assignor to Vogelsbusch Gesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 113,009, Feb. 5, 1971, abandoned. This application July 23, 1973, Ser. No. 381,624

Claims priority, application Austria, Feb. 13, 1970, 1328/70; Feb. 5, 1971, 227/71

Int. Cl. B01d *33/06*

U.S. Cl. 210—77 **15 Claims**



1. The method of filtering a suspension of solids in a liquid carrier with a hollow, cylindrical, rotary vacuum type filter which comprises the carrying out of a cycle including the steps of: effecting continuous rotation of said filter about a horizontal axis; while said filter is rotating, maintaining the pressure within said filter at a level below the pressure exteriorly of the filter to thereby create a force capable of effecting the flow of liquids from the exterior of the filter through said filter to the interior thereof; applying the suspension to be filtered to the exterior of the filter until a layer of at least a selected minimum depth has been formed thereon; then terminating the application of the suspension to the filter; thereafter and without applying additional suspension to said filter or removing any of the solids in said layer, continuing the rotating of the filter and keeping the pressure within the filter at the level below the pressure exteriorly thereof for at least one complete revolution and until the liquid content of the material applied to the exterior of the filter has been reduced to a selected level by the passage of liquid from said layer through the filter to the interior thereof; and subsequently removing material of reduced liquid content from the exterior of the filter, the removal of said material being carried out entirely after the formation of the layer on the filter is completed and the liquid content of the material reduced to the selected level and while the application of the suspension to the filter is interrupted, whereby the removal of liquid from the layer on the filter can be made independent in length of time from the formation of said layer thereon.

3,869,390

ELECTROMAGNETIC FILTER

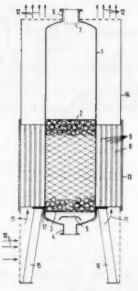
Hans-Gunther Heitmann, Erlangen-Buckenhof, and Gerhard Donath, Erlangen, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim/Ruhr, Germany

Filed Dec. 22, 1972, Ser. No. 317,772

Claims priority, application Germany, Dec. 22, 1971, 2163696

Int. Cl. B01d *35/06*

U.S. Cl. 210—222 **3 Claims**



1. Electromagnetic filter for removing iron oxides from the feed water of boilers in steam power plants of the type having a cylindrical filter vessel, a filter bed of hard-magnetic steel balls and being enclosed by an excitation coil having passages for the passage of coolants, wherein the field intensity produced by said excitation coil is considerably above the saturation field intensity of the steel balls; a magnetic yoke comprising a protective steel jacket surrounding the coil, the wall thickness of said jacket being proportioned in the vicinity of the excitation coil, so as to serve as a magnetic yoke, the ball filling of the filter bed and the thickened part of the protective jacket extending upwardly and downwardly beyond the excitation coil, and an annular body provided with recesses located below the excitation coil and the filter vessel for the support thereof.

3,869,391

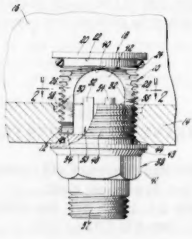
MAGNETIC DRAIN PLUG ASSEMBLY

William L. Kramer, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1974, Ser. No. 456,685

Int. Cl. F16k *37/00*

U.S. Cl. 210—222 **3 Claims**



1. A magnetic drain plug assembly comprising: a valve having a large diameter solid head portion thereon adapted to be located interiorly of an oil sump including seal means thereon and two dependent leg portions, each of said leg

portions having an outer surface with threads formed thereon adapted to be threadably received within an internally threaded oil sump housing bore, a plug having a magnet on one end thereof and an externally threaded flange in surrounding spaced relationship therewith, said flange having locator grooves formed therein, seal means on said plug below said externally threaded flange, said valve and said plug being coupled by insertion of the legs on said valve within said locator grooves when said valve is threadably located within the housing bore so as to locate the seal means thereon in sealing engagement with the housing to prevent oil drainage from the sump, said coupled plug and valve being threadable inwardly of a bore to position said magnet within the sump and to locate the seal means on said plug in sealing engagement with the housing to prevent drainage from the sump when the seal means on said valve is located in spaced relationship to the housing to maintain free communication between the sump and the magnet on said plug.

3,869,392

FILTER CARTRIDGE

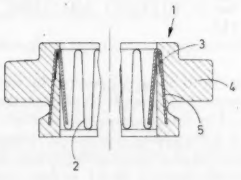
Max Wolf, Stuttgart, Germany, assignor to Knecht Filterwerke Gesellschaft mit beschraenkter Haftung, Stuttgart, Germany

Filed Jan. 29, 1973, Ser. No. 327,452

Claims priority, application Germany, Feb. 3, 1972, 7203991

Int. Cl. B01d *27/06*

U.S. Cl. 210—493 **2 Claims**



1. A filter cartridge comprising a filter body consisting of a sheet of impregnated fibrous filter material pleated in a dense, zig-zag arrangement of uniform parallel folds forming a self-supporting rectangular body terminating in a complete fold at each of its transverse ends and an edge at each of its longitudinal ends, a metal reinforcing strip bent along its length to form a V-shaped member having two legs of a width equal to that of said fold and of a length substantially equal to that of said transverse end folds, said metal strip being located solely over each of said transverse end folds, a frame consisting of a flexible molded plastic material surrounding the perimeter of said filter body, said frame extending over the longitudinal edges and embedding same therein and having a groove for receiving one leg of each of said transverse end folds and said associated metal strip together and embedding the same therein, the other leg of said end fold and said metal strip extending into the interior of said frame.

3,869,393

SOLID LUBRICANT ADHESIVE FILM

Aylwin Reed Booker, Tarzana, Calif., assignor to Everlube Corporation of America, N. Hollywood, Calif.

Continuation-in-part of Ser. No. 39,484, May 2, 1970, abandoned. This application Apr. 7, 1972, Ser. No. 242,137

Int. Cl. C10m *7/26*

U.S. Cl. 252—12.2 **3 Claims**

1. A solid lubricant adhesive film which comprises a film of a normally tacky, pressure-sensitive, adhesive composition selected from the class consisting of polymers of esters of acrylic acid, esters of a methylacrylic acid, esters of vinyl alcohol, ethers of vinyl alcohol, and copolymers of esters of acrylic acid and acylonitrile, methacrylonitrile, acrylic acid, and alphamethylacrylic acid, said film having an adhesive surface and a nonadhesive lubricant surface impregnated with a finely powdered solid lubricant selected from the group consisting of molybdenum disulfide, graphite, lead, tin, silver, polytetrafluoroethylene, and mixtures thereof.

3,869,394

LUBRICANT COMPOSITION AND METHOD

David A. Daniels, Kendall Park, and Nicholas F. DeGeorge, Metuchen, both of N.J., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 152;435, June 11, 1971, abandoned. This application July 16, 1973, Ser. No. 379,821

Int. Cl. C10m *1/46, 1/38*

U.S. Cl. 252—46.7 **19 Claims**

1. A lubricant composition comprising:

a. about 100 parts by weight of a carboxylic acid ester lubricant;

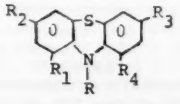
b. a minor stabilizing amount of;

i. a secondary amine selected from a first group consisting of diphenylamine, N-phenyl-1-naphthylamine, N-phenyl-2-naphthylamine, p,p′-dicotyldiphenylamine, N-4-octylphenyl-1-naphthylamine, N-4-octylphenyl-2-naphthylamine, and N-4-octylphenyl-1-octyl-2-naphthylamine; or

ii. a tertiary amine selected from a second group consisting of

N,N-bis-4-octylphenylbenzylamine,
N,N-bis-4-octylphenyl-2-phenylethylamine,
N-4-octylphenyl-N-1-naphtylbenzylamine,
N-4-octylphenyl-N-1-naphthyl-2-phenylethylamine,
N-4-octylphenyl-N-2-naphthylbenzylamine,
N-4-octylphenyl-N-2-naphthyl-2-phenylethylamine,
N,N-bis-4-octylphenyl-2-methylbenzylamine,
N,N-bis-4-octylphenyl-4-methylbenzylamine,
N,N-bis-4-octylphenyl-2-chlorobenzylamine,
N,N-bis-4-octylphenyl-4-chlorobenzylamine,
N,N-bis-4-octylphenyl-2,4-dichlorobenzylamine,
N,N-bis-4-octylphenyl-3,4-dichlorobenzylamine,
N,N-bis-4-octylphenyl-α,α-dichlorobenzylamine,
N,N-bis-4-octylphenyl-2-fluorobenzylamine,
N,N-bis-4-octylphenyl-4-fluorobenzylamine,
N,N-bis-4-octylphenyl-4-nitrobenzylamine, and
N,N-bis-4-octylphenyl-2,2-dimethyl-2-phenylethylamine;

c. a minor stabilizing amount of a phensthiazine having the formula



in which R_1 and R_4 are hydrogen, R_2 is an alkyl group having 1–12 carbon atoms, R_3 is an alkyl group having 1–12 carbon atoms, and R is a radical selected from a third group consisting of 2-chlorobenzyl, 4-chlorobenzyl, 2,4-dichlorobenzyl, 3,4-dichlorobenzyl, and α,α-dichlorophenylmethyl;

d. from 0 to about 1 part by weight of a triazole selected from a fourth group consisting of 3 -amino-1,2,4-triazole, 4-amino-1,2,4-triazole, 1,2,3-benzotriazole, 5-methyl-1,2,3-benzotriazole, and 5,5′-methylene-bis-(1,2,3-benzotriazole); and

e. from about 0 to about 10 parts by weight of a phosphorus containing ester selected from a fifth group consisting of triethyl phosphate, tributyl phosphate, triisooctyl phosphate, tricresyl phosphate, and triphenyl phosphate.

3,869,395

2-AMINO-5-HYDROCARBYLDITHIO-1,3,4-THIADIAZOLE AND COMPOSITIONS THEREOF

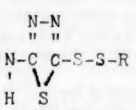
James O. Waldbillig, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,384

Int. Cl. C10m *1/38*

U.S. Cl. 252—47 **9 Claims**

1. A composition comprising a major amount of a hydrocarbon oil of lubricating viscosity and between about 0.01 and 50 wt. percent of an amino hydrocarbyldithio thiadiazole characterized by the formula:



where R is alkyl, aryl, alkaryl or aralkyl of from 1 to 30 carbons and R′ is hydrogen or alkyl, aryl, alkaryl or aralkyl of from 1 to 30 carbons.

3,869,396

LUBRICATING OIL COMPOSITIONS

Eduard J. Van de Kraats, and Johannes De Jong, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 27, 1972, Ser. No. 248,261

Claims priority, application Great Britain, May 5, 1971, 13211/71

Int. Cl. C10m *1/28*

U.S. Cl. 252—56 R **3 Claims**

1. A lubricating oil composition consisting essentially of a wax-containing hydrocarbon lubricating oil having a viscosity of less than about 10 cS at 210°F and dewaxed to a pour point of about 0°F or less and from about 0.01 to 2 percent by weight of oil-soluble copolymer of polyalkyl methacrylates having (a) a molar percentage of alkyl methacrylates with branched alkyl chains from 5 to 25 percent, (b) at least eight alkyl chains with a different number of carbon atoms in which the number of alkyl chains of 9 carbon atoms is from 2 to 10 percent of the total number of alkyl chains, and (c) a number average molecular weight between 5,000 and 500,000, wherein the alkyl groups in said alkyl methacrylates contain 9 to 18 carbon atoms with an average of from 12.8 to 13.5 carbon atoms.

3,869,397

ELECTROSTATIC TONER COMPOSITION

J. C. Tristan Tellier, Conklin, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Nov. 1, 1972, Ser. No. 302,885

Int. Cl. G03g *9/04*

U.S. Cl. 252—62.1 **7 Claims**

1. An electrostatic liquid toner comprising

a. an electrically insulating carrier liquid comprising a hydrocarbon wherein said carrier liquid has a dielectric constant of less than 3 and a volume resistivity in excess of 10^{10} ohm centimeter;

b. from about 0.01 to about 10 percent of a pigment;

c. a metallic soap; and

d. from 0.1 to 1 part by weight, per part by weight of said pigment, of a copolymer of an alkyl vinyl ether and maleic anhydride wherein the alkyl group of said alkyl ether contains 12 to 40 carbon atoms.

3,869,398

DIELECTRIC PORCELAIN COMPOSITION

Nobutatu Yamaoka, Takasaki, and Yasunori Takahashi, Tokyo, both of Japan, assignors to Taiyo Yuden Kabushiki Kaish and Sony Corporation, both of Tokyo, Japan

Filed Aug. 23, 1973, Ser. No. 390,948

Claims priority, application Japan, Sept. 20, 1972, 47-93697

Int. Cl. H01b *3/02*

U.S. Cl. 252—63.5 **1 Claim**

1. A dielectric porcelain composition comprising a sintered product consisting essentially of above 2% by weight but below 31% by weight of lead titanate ($PbTiO_3$), above 35% by weight but below 83% by weight of strontium titante ($SrTiO_3$), above 3% by weight but below 19.1% by weight of bismuth oxide (Bi_2O_3), above 0.5% by weight but below 18% by weight of titanium oxide (TiO_2) and above 2.8% by weight but below 20.1% by weight of calcium titanate ($CaTiO_3$), the weight ratio of titanium oxide (TiO_2) to bismuth oxide (Bi_2O_3) being between 0.2 and 2.0.

3,869,399

LIQUID DETERGENT COMPOSITIONS

Jerome Howard Collins, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 31, 1972, Ser. No. 222,363

Int. Cl. C11d *1/83, 9/46, 17/08*

U.S. Cl. 252—118 **3 Claims**

1. A liquid fabric cleaning detergent composition consisting essentially of

a. from about 30 to about 60 percent by weight of a nonionic surfactant having an HLB of from about 8 to about 15 produced by the condensation of ethylene oxide with an organic hydrophobic compound selected from the group consisting of alkyl phenols wherein the alkyl group contains from about 6 to 12 carbon atoms in either straight chain or branched chain configuration; aliphatic alcohols containing from about 8 to 22 carbon atoms in straight chain or branched chain configuration; the condensation product of propylene oxide with propylene glycol said condensation product having a molecular weight of from about 1,500 to about 1,800; and, the reaction product of propylene oxide and ethylene diamine, said reaction product having a molecular weight of from about 2,500 to about 3,000;

b. an anionic surfactant mixture present in a quantity sufficient to provide a weight ratio of nonionic surfactant to the anionic surfactant mixture in its free acid form of from about 2.5:1 to about 3.5:1; said anionic surfactant mixture consisting of

i. an ethanolamine alkyl benzene sulfonate having a linear alkyl chain which averages about 12 carbon atoms in length; and

ii. an ethanolamine soap containing from about 10 to about 20 carbon atoms in the fatty acid moiety of said soap;

the ethanolamine moiety of the sulfonate and soap being selected from the group consisting of monoethanolamine, diethanolamine and triethanolamine and said anionic surfactant mixture containing sulfonate and soap in quantities sufficient to provide a weight ratio of the acid form of the sulfonate to the acid form of the soap of from about 4:1 to 8:1;

c. an ethanolamine selected from the group consisting of monoethanaolamine, diethanolamine, triethanolamine and mixtures thereof, present in an amount effective to provide at least about 1 percent by weight of the composition of free ethanolamine;

d. from about 25 to about 45 percent by weight of a solvent, said solvent being a water-ethanol mixture having a water to ethanol weight ratio of from about 4:1 to about 7:1; and

e. from about 1 to about 3 percent by weight of potassium chloride; and

f. an ethanolamine citrate in a concentration based on the citric acid form of from about 0.05 up to about 1 percent by weight of composition.

3,869,400

PROCESS FOR PRODUCING AN AQUEOUS REACTION PRODUCT SLURRY OF A DIAMINE AND A DIACID

Albert Thomas Strand, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 17, 1972, Ser. No. 298,304
Int. Cl. C09k *3/00*
U.S. Cl. 252—182 **3 Claims**

1. A process for producing a stable, pumpable aqueous slurry consisting essentially of about 10–35 percent by weight of a salt which is the reaction product of essentially equivalent amounts of diamine and diacid, the diamine being at least 75 mol percent bis(4-aminocyclohexyl)-methane and the diacid being at least 75 mol percent 1,12-dodecanedioic acid comprising producing a water solution of the salt(s) at a temperature above 100°C. and at autogenous or greater pressure, the salt solution having a concentration of about 50–70 percent, adding the salt solution to sufficient water at about 20–50°C. and under agitation to form a salt slurry of not over 35 percent concentration, measuring the pH of the slurry and adjusting it to a predetermined value by addition of diamine or diacid, and maintaining the slurry in pumpable condition under agitation or recirculation until required for use.

3,869,401

STABILIZED ACIDIC HYDROGEN PEROXIDE SOLUTIONS

Richard Edward Ernst, Memphis, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 4, 1972, Ser. No. 311,975
Int. Cl. C01b *15/02*; **B01d** *53/00*
U.S. Cl. 252—186 **9 Claims**

1. A concentrated, acidic, aqueous solution of hydrogen peroxide stabilized against chloride ion-induced degradation by about **5** to **50,000** ppm by weight of a stabilizer selected from the group consisting of:

a. dihydroxybenzenes, alkyl derivatives of phenol and dihydroxybenzenes, said derivatives containing one or two lower alkyl substituents, and mononitrophenols;

b. unsaturated aliphatic amines having a chain length of three to five carbon atoms;

c. compounds containing a dicarbonyl methylene group

and capable of enolization in acid media;

d. sodium styrene sulfonate; allyl acetate; and mixtures of the foregoing.

4. An aqueous, acidic oxidizing solution stabilized against chloride ion-induced degradation at temperatures from ambient to about **90°** C. containing about **0.1** to **5** percent by weight hydrogen peroxide, about **30** to **85** percent by weight of a strong acid selected from the group consisting of H_2SO_4, mixtures of H_2SO_4 and H_2SO_5, CH_3COOH, and their mixtures and about **5** to **50,000** ppm by weight of a stabilizer selected from the group consisting of:

a. phenol, dihydroxybenzenes, and their alkyl derivatives containing one or two lower alkyl substituents, and mononitrophenols;

b. unsaturated aliphatic alcohols and amines having a chain length of three to five carbon atoms but excluding unsubstituted alkynyl alcohols;

c. compounds containing a dicarbonyl methylene group

and capable of enolization in acid media;

d. sodium styrene sulfonate; allyl acetate; and mixtures of the foregoing.

3,869,402

METHOD FOR MAKING ANTIHALATION LAYER

E. Scudder Mackey, and Albert J. Neschleba, both of Binghamton, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed July 5, 1972, Ser. No. 269,059
Int. Cl. G03c *1/84*
U.S. Cl. 252—300 **8 Claims**

1. A process for the preparation of an anti-halation layer which comprises (a) reacting an alkali metal permanganate with a reductant compound of the formula

$R\text{-}(OH)_x$

wherein

R is a C_2 to C_n aliphatic radical and x is 2 to 4 and when R is C_6 to C_8 x may also be 1, the ratio of oxygen atoms to carbon atoms being at least 1:2 and where x is 1, the ratio is at least 1:5; (b) thereafter adding gelatin to the reaction product produced in (a).

3,869,403

NEODYMIUM DOPED ACETATE GLASS EXHIBITING FLUORESCENCE AT 1.06 MICROMETERS

Robert R. Shaw, Sturbridge, and Elias Snitzer, Wellesley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jan. 11, 1973, Ser. No. 322,679
Int. Cl. C09k *1/02*; **C03c** *3/28, 3/12*
U.S. Cl. 252—301.3 R **4 Claims**

1. An acetate glass which exhibits fluorescence at a wavelength of 1.06 um consisting essentially of about 6 weight percent of $Nd(C_2H_3O_2)_3$ in a host glass selected from a group consisting of $Pb(C_2H_3O_2)_2$, $KC_2H_3O_2$, $NaC_2H_3O_2$, $Ca(C_2H_3O_2)_2$, and combinations thereof, the $Nd(C_2H_3O_2)_3$ contributing trivalent neodymium ions to the glass.

3,869,404

NEODYMIUM DOPED $NA_2O{\cdot}P_2O_5$-$ZNCL_2$GLASS EXHIBITING FLUORESCENCE AT 1.06 MICROMETERS

Robert R. Shaw, Sturbridge, and Elias Snitzer, Wellesley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jan. 11, 1973, Ser. No. 322,678
Int. Cl. C09k *1/06*; **C03c** *3/28, 3/16*
U.S. Cl. 252—301.6 P **6 Claims**

1. A glass which exhibits fluorescence at a wavelength of 1.06 um consisting essentially of 98 to 99 weight percent of a host glass consisting essentially of 30 to 50 mol percent of $Na_2O.P_2O_5$ and 50 to 70 mol percent of $ZnCl_2$ and 1 to 2 weight percent of a compound contributing trivalent neodymium ions where the compound is selected from a group consisting of Nd_2O_3, NdF_3 and $NdCl_3$.

3,869,405

GLASS EXHIBITING FLUORESCENCE AT 1.06 MICROMETERS

Robert R. Shaw, Sturbridge, and Elias Snitzer, Wellesley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jan. 11, 1973, Ser. No. 322,670
Int. Cl. C09k *1/04*; **C03c** *3/28, 3/12*
U.S. Cl. 252—301.6 S **2 Claims**

1. A sulfate glass which exhibits fluorescence at a wavelength of 1.06 μm consisting essentially of 98 weight percent of a host glass which consists essentially of 90 mol percent of

the glass former $ZnCl_2$ and 10 mol percent of the glass modifier Na_2SO_4 and 2 weight percent of $Nd_2(SO_4)_3$.

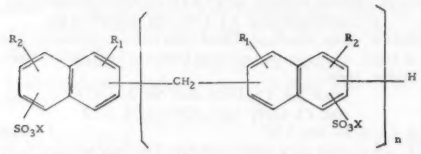
3,869,406

PROCESS FOR PREPARING MICROSCOPIC CAPSULES

Hirohara Matsukawa, and Keiso Saeki, both of Fujimiya, Japan, assignors to Fuji Photo Film, Kanagawa, Japan

Filed May 24, 1972, Ser. No. 256,493
Claims priority, application Japan, May 24, 1971, 46-35316
Int. Cl. B01j *13/02;* **B44d** *1/02*
U.S. Cl. 252—316 **11 Claims**

1. In a process for preparing microcapsules by coacervation using a solution containing at least two hydrophillic colloids having opposite electric charges, at least one of said colloids being gellable, comprising emulsifying or dispersing a hydrophobic oil or dust in said solution, causing coacervation of said colloids to form a coacervate wall, gelling said coacervate wall, and hardening said coacervate wall, the improvement comprising on hardening the coacervate wall, at a temperature not higher than the gel point of said gellable colloid, adding an aqueous solution of (1) a high molecular weight electrolyte having an anionic functional group in a shock-preventing amount which is sufficient to prevent a rapid increase in viscosity and coagulation of the system, and (2) a condensate represented by the following general formula in an amount sufficient to accelerate the shock-preventing action of the high molecular weight electrolyte (1), which condensate is different from the high molecular weight electrolyte (1);



wherein R_1 and R_2 can each represent a hydrogen atom or an alkyl group having from 1 to about 18 carbon atoms, so long as at least one of R_1 and R_2 is an alkyl group, X represents a hydrogen atom or an alkali metal atom and n is a positive integer, wherein said anionic high molecular weight electrolyte is selected from the group consisting of an anionic cellulose derivative selected from the group consisting of carboxymethyl cellulose, carboxyethyl cellulose and the metal salts thereof, and cellulose sulfate, cellulose phosphate and metal salts thereof, an anionic polysaccharide selected from the group consisting of pectin and pectin acid, a polyvinylbenzenesulfonic acid copolymer selected from the group consisting of vinylbenzenesulfonate-acryloylmorpholine copolymer, vinylbenzenesulfonate-morpholinomethyl acrylamide copolymer, vinylbenzenesulfonate-vinylpyrrolidone copolymer and vinylbenzenesulfonate-methoxymethylacrylamide, a polyacrylic acid copolymer selected from the group consisting of acrylic acid-acryloylmorpholine copolymer, acrylic acid-morpholinomethyl acrylaminde copolymer, acrylic acid-acrylamide copolymer, acrylic acid-vinylpyrrolidone copolymer and acrylic acid-methoxymethylacrylamide copolymer, and an anionic starch derivative selected from the group consisting of carboxymethyl starch, carboxyethyl starch, starch sulfate, starch phosphate and starch xanthate.

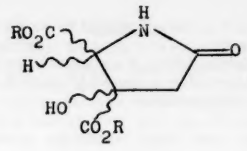
3,869,407

AMINO CITRIC ACID DERIVATIVES

Robert William Guthrie, Fairfield, and Richard Wightman Kierstead, North Caldwell, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 204,290, Dec. 2, 1971, Pat. No. 3,799,951. This application Jan. 21, 1974, Ser. No. 435,146
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.45 **8 Claims**

1. A compound of the formula



wherein

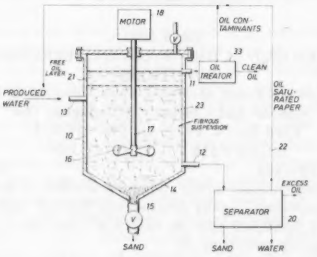
all R groups are hydrogen or the same lowr alkyl, lower and the stereoisomers, optical antipodes and pharmaceutically acceptable salts thereof.

3,869,408

METHOD AND APPARATUS FOR CONTINUOUSLY SEPARATING EMULSIONS

John A. Herce, Bellaire, and James E. Heath, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed July 13, 1972, Ser. No. 271,441
Int. Cl. B01d *19/00*
U.S. Cl. 252—361 **8 Claims**



1. Apparatus for continuously separating oil and water from an oil-in-water emulsion comprising:

a vessel;

an aqueous suspension of preferentially water wet, substantially oil-saturated, oil-trapping, oil-coalescing, nongranular, disassociated, cellulosic, fibrous material contained within the vessel;

agitating means for agitating the aqueous suspension of substantially oil-saturated, oil-trapping fibrous material contained within the vessel in such a manner that oil and water separate;

oil outlet means adjacent the top of the vessel for withdrawing a separated oil phase from the vessel;

said agitating means lying below said separated oil phase;

aqueous phase outlet means positioned on said vessel below the oil outlet means for continuously withdrawing an aqueous phase from the vessel; and

means for admitting an oil and water emulsion into the vessel at a point remote from said oil and water outlets.

3,869,409

PROCESS FOR PREPARING A WIDE-PORE ADSORBENT FOR USE IN CHROMATOGRAPHY

Natalya Karlovna Bebris, ulitsa 26 Bakinshikh komissarov, 4, korp. 4, kv. 52; Andrei Vladimirovich Kiselev, Leningradskoe shosse, 120, korp. 3, kv. 4; Jury Stepanovich Nikitin, Leninskie Gory, MGU, Zona M, kv. 160, all of, Moscow, and Yakov Ivanovich Yashin, propsekt Tsiolkovskogo, 50, kv. 143, Dzerzhinsk Gorkovskoi Oblasti, all of U.S.S.R.

Filed June 8, 1972, Ser. No. 260,734

Int. Cl. B01j *11/06, 11/36*

U.S. Cl. 252—446 **9 Claims**

1. A process for preparing a wide-pore silicon-containing adsorbent for chromatography, comprising preparing a suspension of a finely dispersed non-porous silica having a specific surface 30 to 380 m^2/g in a suitable liquid dispersion medium containing a modifying component selected from the group consisting of alkalis, alkali metal salts, alkaline-earth metal salts, carbon black, polyphenyldisiloxane, and a condensation product of phenolphthalein and phthalic acid; and drying said suspension at a temperature of about 15° to 200°C to form a silica xerogel.

3,869,410

CATALYST CARRIER FOR EXHAUST GAS PURIFIER

Tsuchio Bunda, Okazaki; Itaru Niimi, Nagoya; Yasuhisa Kaneko, and Fumiyoshi Noda, both of Tokyo, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed Sept. 1, 1972, Ser. No. 285,594

Claims priority, application Japan, Sept. 3, 1971, 46-67922

Int. Cl. B01f *11/06*

U.S. Cl. 252—455 R **5 Claims**

1. A method for manufacturing a catalyst carrier of a sintered-bonded mass of coated hollow alumina balls for an exhaust gas purifier, comprising:

a. immersing a plurality of hollow alumina balls having a size of 2–5mm in outside diameter in a mixture of colloidal silica and colloidal alumina,

b. air-drying the hollow alumina balls coated with said silica and alumina,

c. placing said coated alumina balls in a mass so that the balls are in contact with each other,

d. sintering said mass of alumina balls to form a sintered-bonded mass,

e. immersing said mass of alumina balls in colloidal alumina, and

f. air-drying, heating and cooling said mass of alumina balls.

3,869,411

NOVEL FRAGRANCE MATERIALS

John B. Hall, Rumson, N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 9, 1973, Ser. No. 349,180

Int. Cl. C11b *9/00*

U.S. Cl. 252—522 **4 Claims**

1. A perfume composition comprising from 3.0% up to 50% by weight of said composition of 2,5,5 trimethylacetylcycloheptane, and a suitable perfume carrier.

3,869,412

SURFACE-ACTIVE COMPOSITIONS HAVING CONTROLLED FOAMING PROPERTIES AND PROCESS FOR CONTROLLING FOAM THEREWITH

Ake Waag, Kattfotsvagen 3, Stenungsund, Sweden

Continuation-in-part of Ser. No. 648,248, June 23, 1967, abandoned, and a continuation-in-part of Ser. No. 117,073, Feb. 19, 1971, Pat. No. 3,741,913, and a continuation-in-part of Ser. No. 16,250, March 3, 1970, abandoned, and a continuation-in-part of Ser. No. 32,430, April 27, 1970, abandoned. This application Dec. 20, 1971, Ser. No. 210,161

Claims priority, application Sweden, June 23, 1966, 8678/66; Mar. 4, 1969, 2944/69

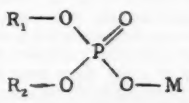
Int. Cl. C11d *3/075, 1/78, 1/83*

U.S. Cl. 252—527 **28 Claims**

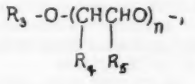
1. A surface-active composition having controlled foaming properties, and consisting essentially of, in combination, a surfactant selected from the group consisting of anionic sulphonate and sulphate surfactants, a nonionic surfactant selected from the group consisting of polyoxyalkylene ether, -ester and -glycol surfactants, and a polyoxyalkylene phosphate ester surfactant, the combination of the polyoxyalkylene ether, -ester or -glycol surfactant and polyoxyalkylene phosphate ester surfactant having a low foaming property which is controllably increased by the proportion of anionic sulphate or sulphonate surfactant, the relative proportions of the anionic, nonionic and phosphate surfactants falling within the ranges:

	% by weight
Anionic sulphate or sulphonate surfactant	1 – 95
Nonionic Polyoxyalkylene ether, -ester or -glycol surfactant	1 – 95
Polyoxyalkylene phosphate ester surfactant	1 – 95

the polyoxyalkylene phosphate ester having the formula:



wherein R_1 and R_2 are selected from hydrogen and polyoxyalkylene ether radicals, and no more than one of R_1 and R_2 is hydrogen, the polyoxyalkylene ether radical being of the form



wherein n has a value greater than zero up to about 30, and denotes the average number of oxyalkylene units in the chain, R_4 and R_5 are hydrogen or methyl, and R_3 is a primary or secondary straight or branched chain saturated or unsaturated radical having from about 10 to about 24 carbon atoms, or a mono-, di-, or trialkyl-substituted phenyl radical having from about 6 to about 24 carbon atoms; and M is hydrogen or a water-soluble salt-forming cation.

3,869,413

FLEXIBLE POLYURETHANE FOAMS

Larry Thomas Blankenship, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 410,136, Oct. 26, 1973,. This application Mar. 4, 1974, Ser. No. 448,166

Int. Cl. C08g 22/44, 41/04

U.S. Cl. 260—2.5 BE 22 Claims

1. Flexible polyurethane foams prepared by subjecting to foaming conditions a composition comprising

1. a polyol composition consisting essentially of

A. from about 50 to about 98 parts by weight of a polyether polyol or mixture of such polyols having from 2 to 3 hydroxyl groups per molecule and an OH equivalent weight of from about 900 to about 2300 and

B. from about 50 to about 2 parts by weight of a solid polymer of one or more ethylenically unsaturated monomers free from groups reactive with NCO or OH groups under urethane-forming conditions, said solid polymer having a molecular weight of at least about 5,000; said polyol composition having been prepared by adding Component (B) in the form of a latex having an average particle size of from about 1000 A to about 7000 A to Component (A) and subsequently removing water therefrom to the extent that the resulting mixture contains from zero to that quantity of water desired to be employed in the foaming reaction by the formation of CO_2 through reaction of such water with a polyisocyanate; and

2. an organic polyisocyanate;

wherein Components 1 and 2 are employed in quantities such that the NCO:active hydrogen ratio is from about 0.80:1 to about 1.5:1.

3,869,414

WAX EMULSIONS CONTAINING PROTEINACEOUS EMULSIFIERS

Craig C. Campbell, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,413

Int. Cl. B01j 13/00

U.S. Cl. 260—6 5 Claims

1. An emulsion suitable for use as a coating or waterproofing agent consisting essentially of, by weight, from about 25 to about 70 percent wax, from about 0.2 to about 10 percent of an amphoteric proteinaceous emulsifier, from about 0.5 to about 10 percent of a clay, from about b **0.5** to about 15 percent of an urea-formaldehyde resin and water in an amount sufficient to form the emulsion.

3,869,415

RESINOUS POLYMER CONTAINING WATERPROOFING PLASTER COMPOSITIONS

John Williams, Maidstone, England, assignor to Temec Limited, Wembley, England

Continuation-in-part of Ser. No. 106,900, Jan. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 727,037, May 6, 1968, abandoned. This application Aug. 14, 1973, Ser. No. 388,143

Claims priority, application Great Britain, Apr. 4, 1968, 16352/68; Jan. 16, 1970, 0276/70

Int. Cl. C08f 45/04, 45/24

U.S. Cl. 260—17 R 23 Claims

1. A plaster composition having water-resistance properties comprising 30 to 60% by weight of calcium sulfate plaster solids, 0.25 to 15% by weight of a low molecular weight resin selected from the group consisting of polyvinyl chloride, polyvinyl acetate, petroleum and coal tar hydrocarbon polymer resins and styrene and acrylic copolymers, 4 to 48% of a substantially water-immiscible organic solvent for said resin and 20 to 50% by weight of water, said organic solvent having the property of evaporating from the composition at a rate similar to the rate of evaporation of water therefrom.

3,869,416

REINFORCED WAX COMPOSITIONS HAVING UNIVERSAL ADHESION

George Lok-Kwong Hoh, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 22, 1973, Ser. No. 343,684

Int. Cl. C09j 3/26

U.S. Cl. 260—27 R 10 Claims

1. An adhesive composition comprising (I) petroleum wax reinforced with ethylene/olefin copolymer reinforcing resin wherein the olefin comonomer is C_3–C_{18} alpha-olefin and/or unconjugated diolefin and (II) an adhesion promoting system consisting essentially of:

a. a polar polymeric additive selected from

1. an ethylene/organic ester copolymer containing at least 85 mole percent copolymerized ethylene and at least 9.5 mole percent of a copolymerized vinyl alcohol ester of a C_1–C_4 saturated monocarboxylic acid or at least 7 mole percent of a copolymerized C_1–C_5 saturated aliphatic alcohol ester of acrylic or methacrylic acid, and 2. an ethylene/carboxylic acid or anhydride copolymer containing at least 85 mole percent copolymerized ethylene and 0.15–5 mole percent copolymerized acid, or acid partial ester with C_1–C_5 alcohols, or anhydride, and

b. a tackifying resin selected from wood rosin or derivatives thereof; said polar polymeric additive (a) being present in an amount of 10–30 parts and said tackifying resin (b) being present in an amount of 25–50 parts, both based upon 100 weight parts of (I).

3,869,417

MODIFICATION OF ASPHALT WITH ETHYLENE-VINYL ACETATE COPOLYMERS TO IMPROVE PROPERTIES

Ray D. Ramsay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1971, Ser. No. 115,538

Int. Cl. C08f 45/52

U.S. Cl. 260—28.5 AS 7 Claims

1. A coating composition consisting essentially of 95 weight percent of an oxidized asphalt having a penetration at 77° F., after oxidation, of about 35 and a ring and ball softening point, after oxidation, of about 165° F. and about 5 weight percent of an ethylene-vinyl acetate copolymer having a vinyl acetate content in the range of 17 to 19 weight percent, a melt index in the range of 2.1 to 2.9, and a ring and ball softening point of about 390° F.

3,869,418

CARBOXYLATED GRAFT COPOLYMER AND EMULSION CONTAINING SAME

William R. Peterson, and Walter N. Johnson, both of Chattanooga, Tenn., assignors to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 171,006, Aug. 11, 1971, abandoned. This application June 15, 1973, Ser. No. 370,420

Int. Cl. C08d 1/09, 3/02; C08f 7/14, 19/06

U.S. Cl. 260—29.7 T 14 Claims

1. A stable aqueous emulsion comprising an emulsion polymerized graft polymer, comprising a polymeric N-vinyl lactam substrate and at least one monomeric olefinically unsaturated aliphatic carboxylic acid and at least one monomer selected from the group consisting of aliphatic conjugated dienes and monoalkenyl aromatic compounds, graft polymerized thereon, the weight ratio of polymeric N-vinyl lactam to the total monomeric mixture varying from about 1:99 to about 20:80, the weight ratio of monoalkenyl aromatic monomer to conjugated diene varying from about 5:95 to about 75:25, and the unsaturated aliphatic carboxylic acid is employed in proportions of about 0.5 to about 20 parts by weight per 100 parts of total monomeric mixture.

3,869,419

ANISOTROPIC DOPES OF POLYAMIDES FROM FUMARIC AND/OR MESACONIC ACID

Paul Winthrop Morgan, West Chester, Pa., and Terry Carl Pletcher, Hockessin, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1972, Ser. No. 301,292
Int. Cl. C08g *51/46, 51/47*
U.S. Cl. 260—30.8 R **3 Claims**

1. A anisotropic dope of a polymer in concentrated sulfuric acid within the concentration range of about 96–105% H_2SO_4 or in fluorosulfonic acid, said polymer consisting essentially of repeating units of the formula:

$$—HN—R_1—NHCO—R_2—CO—$$

wherein R_1 represents an aromatic radical selected from the group of 1,4-phenylene; methyl-1,4-phenylene; chloro-1,4-phenylene; bromo-1,4-phenylene, fluoro-1,4-phenylene; 4,4′-carbonamidodiphenylene; 4,4′-biphenylene; 3,3′-dichloro-4,4′-biphenylene; 3,3′-dimethoxy-4,4′-biphenylene; and 3,3′-dimethyl-4,4′-biphenylene; R_2 represents an organic radical selected from the group of trans-vinylene and trans-methylvinylene radicals; with the proviso that up to 90 mole percent of the R_2 radicals may be replaced by radicals selected from the group of 1,4-phenylene and chloro-1,4-phenylene, the said polymer having an inherent viscosity of at least about 1.0.

3,869,420

SMOKE-RETARDANT HALOGEN-CONTAINING POLYMER SYSTEMS

Thomas C. Mathis, St. Louis, Mo., and Albert W. Morgan, Collinsville, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1972, Ser. No. 317,040
Int. Cl. C09k *3/28*
U.S. Cl. 260—30.6 R **13 Claims**

1. A vinyl chloride polymer composition comprising

1. from about 10 to about 30 parts per hundred parts resin of a reactive modifier selected from the group consisting of
   a. Dawsonite,
   b. oxide, hydroxide or salt of a metal selected from the group consisting of sodium, potassium, magnesium, barium, zirconium, manganese and iron, and
   c. mixtures thereof; and
2. from about 10 to about 100 percent based on total plasticizer of at least one halogen-free neutral phosphate ester the minimum amount of total plasticizer being about 10 parts per hundred parts of resin.

3,869,421

RESILIENT OIL-EXTENDED POLYURETHANE SURFACES

George G. Sapp, San Pablo, and Joseph L. Goodrich, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 129,130, March 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 54,013, July 10, 1970, abandoned. This application Dec. 11, 1972, Ser. No. 314,060
Int. Cl. C08g *51/28*
U.S. Cl. 260—33.6 AQ **11 Claims**

1. A resilient surface up to about 2 inches in thickness prepared from a workable mixture consisting essentially of 1 part by weight of a polyurethane prepared in situ from a polyisocyanate and a polyol, wherein said polyol is at least 50% by weight of a diol of from 1,000 to 5,000 molecular weight selected from polybutadiene diols, polyisoprene diols, polybutadiene-styrene diols and polybutadiene-acrylonitrile diols and said polyisocyanate is used in an equivalent ratio of from 0.8 to 1.50 isocyanate groups to one hydroxyl group from said polyol, (2) from 0.6 to about 4.5 parts by weight of an extender oil having an aniline point in the range of from about 75° to 130°F and a viscosity of from about 200 to 6,000 SUS at 100°F, (3) from about 0.25 to about 4.5 parts by weight of resilient aggregate, wherein said resilient aggregate has a maximum dimension of not more than 1.0 inch, all of which will pass through a No. 3 U.S. standard sieve, not more than 30% by weight of which will pass through a No. 16 U.S. standard sieve, and not more than 5% by weight of which will pass through a No. 30 U.S. standard sieve, (4) from 0 to about 1.8 part mineral filler having a size in the range of 20 mesh, U.S. standard sieve to dust, (5) from 0 to about 0.5 part drying agent or its hydrated form, (6) from 0 to about 0.5 part of a polyurethane catalyst, and (7) from 0.08 to about 0.45 part carbon black; wherein said extender oil is present in an amount of from about 12 to about 60 weight percent of the total composition and said polyurethane is present in an amount of from about 5 to about 35 weight percent of the total composition.

3,869,422

BLEND OF POLYMERS

James Wilkinson Dawes, Clinton, Iowa; Kurt Lothar Seligman, Wilmington, Del., and Stanley George Smith, Beaumont, Tex., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 8, 1972, Ser. No. 313,360
Int. Cl. C08f *37/18, 45/08*
U.S. Cl. 260—42.47 **5 Claims**

1. A water-impermeable heat-sealable thermoplastic film of a uniform blend of a polymeric composition consisting essentially of:

a. 40–80 weight percent of a crystalline copolymer of ethylene and an α,β-ethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid and methacrylic acid, or mixtures thereof, wherein said carboxylic acid is present in the copolymer in amounts of from about 5–15 weight percent, and said carboxylic acid is free of neutralizing metal ions,
b. 20–45 weight percent of an amorphous elastomeric copolymer of ethylene containing 20–60 weight percent propylene and up to about 10 weight percent of a non-conjugated diene.

3,869,423

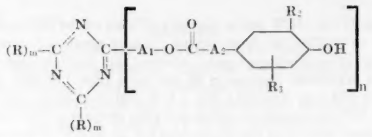
ORTHO-SUBSTITUTED HYDROXYPHENYL ALKYLENE-ARBOXY-ALKYLENE-1,3,5-TRIAZINES AND ANTIOXIDANT AND SYNTHETIC RESIN COMPOSITIONS

Motonobu Minagawa, Koshigaya, and Kuniaki Nomura, Ohmiya, both of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,751
Int. Cl. C08f *45/58;* **C08g** *51/58*
U.S. Cl. 260—45.8 NT **9 Claims**

1. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350°F., comprising a polyvinyl chloride resin formed at least in part of the recurring group

and having a chlorine content in excess of 40 percent, where X is either hydrogen or chlorine; and from about 0.001 to about 5 percent by weight of an ortho-substituted hydroxyphenyl-alkylene carboxyalkylene-1,3,5-triazine having the general formula:



wherein:

n is an integer from 1 to 3;

m is an integer from 0 to 2;

A_1 is selected from the group consisting of alkylene having from one to about four carbon atoms and alkyl alkylene, the alkyl having from one to about fourteen carbon atoms and the alkylene having from one to about four carbon atoms, and amino NHA_3, wherein A_3 is selected from the group consisting of alkylene having from one to about four carbon atoms and alkyl alkylene, the alkyl having from one to about fourteen carbon atoms and the alkylene having from one to about four carbon atoms;

A_2 is alkylene having from one to about four carbon atoms; R_2 and R_3 are selected from the group consisting of hydrogen and alkyl having from one to about four carbon atoms; R_2 is ortho to the hydroxyl, and R_3 can be ortho or meta to the hydroxyl;

R is linked to carbon and is selected from the group consisting of oxo, alkyl, aryl, cycloalkyl and hydroxy alkyl, and NHR_1, R_1 being selected from the group consisting of alkyl, cycloalkyl or hydroxyalkyl;

the R alkyl groups having from one to about eighteen carbon atoms, the R cycloalkyl groups having from three to about eight ring carbon atoms, any remaining carbon atoms being in alkyl substituents attached to the ring, the R aryl groups having six carbon atoms, ten carbon atoms, and fourteen carbon atoms.

3,869,424

POLYACRYLATE PLASTIC COMPOSITIONS CONTAINING BIS-ARYLOXY FLAME RETARDANTS

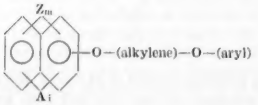
Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, St. Louis, Mich.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,794The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl. C08f *45/60*

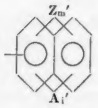
U.S. Cl. 260—45.9 R **18 Claims**

1. A plastic composition containing polyacrylate having incorporated therein a flame retardant which is a bis-aryloxy compound having the formula:



wherein aryl is from the group

and



Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1–7; *y* is an integer having a value of 1–5; *i* and *i'* are integers having a value of 0–2; A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halophenyl, benzyl or halo-benzyl; and alkylene is a straight or branched chain alkylene group having from one to six carbon atoms.

3,869,425

POLY(PHENYLENE OXIDE) PLASTIC COMPOSITIONS CONTAINING BIS-PHENOXY FLAME RETARDANTS

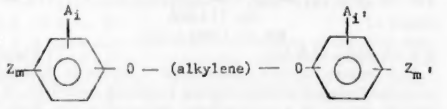
Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, St. Louis, Mich.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,791. The portion of the term of this patent subsequent to May 4, 1991, has been disclaimed.

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.9 R **17 Claims**

1. A plastic composition containing poly(phenylene oxide) having incorporated therein an effective amount of a flame retardannt which is a bis-phenoxy compound having the formula:



wherein Z is bromine; *m* and *m'* are integers having a value of 1–4; *i* and *i'* are integers having a value of 1 or 2; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl, or halo- benzyl, with the proviso that when *m* or *m'* is 4, *i* or *i'* respectively is 1.

3,869,426
POLYESTER PLASTIC COMPOSITIONS CONTAINING BIS-ARYLOXY FLAME RETARDANTS

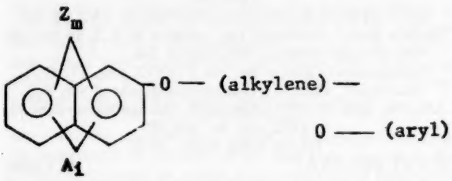
Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, St. Louis, Mich.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,859. The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

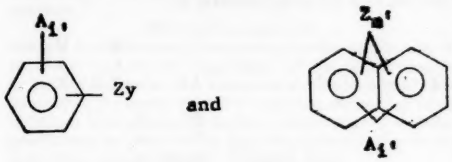
Int. Cl. C08q *51/60*

U.S. Cl. 260—45.9 R **18 Claims**

1. A plastic composition containing polyester having incorporated therein a flame retardant which is a bis-aryloxy compound having the formula:



wherein aryl is from the group



Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1–7; *y* is an integer having a value of 1–5; *i* and *i'* are integers having a value of 0–2; A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl or halo-benzyl; and alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms.

3,869,427
TREATMENT OF LINEAR POLYESTER WITH ORGANIC MONOEPOXIDE

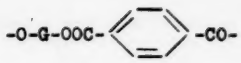
Robert Walter Meschke, Kinston, and William Harrison Watson, Grifton, both of N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 533,454, March 11, 1966, abandoned. This application Nov. 23, 1966, Ser. No. 596,429

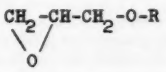
Int. Cl. C08g *17/14*

U.S. Cl. 260—47 EP **8 Claims**

1. In the preparation of synthetic linear terephthalate condensation polyester in which at least about 85% of the recurring structural units are units of the formula:



wherein —G— represents a divalent organic radical containing from about 2 to about 18 carbon atoms which is attached to the adjacent oxygen atoms by saturated carbon atoms, the improvement which comprises reducing the content of free carboxyl groups in the polyester by mixing the polyester in molten form for 1 minute to about 45 minutes with a liquid organic monoepoxide represented by the formula:



where R is a monovalent phenyl or n-hexyl radical, the organic monoepoxide being added to the polyester after polymerization of the polyester to an intrinsic viscosity of at least 0.56, when determined for solutions of the polyester in phenol/trichlorophenol at 25°C., and being added in an amount providing less than 3 mol per cent based on the polyester and at least 0.1 mol per equivalent of free carboxyl groups present in the polyester prior to addition of the monoepoxide.

3,869,428
ENAMEL COMPOSITION FOR THE MANUFACTURE OF SOLDERABLE ENAMELED WIRES

Hans Mosimann, Breitenbach; Peter Heim, Basle, and Charles Borer, Grindel, all of Switzerland, assignors to Schweizerische Isola-Werke, Breitenbach, Switzerland

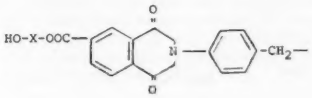
Continuation-in-part of Ser. No. 37,355, May 14, 1970, abandoned. This application May 2, 1973, Ser. No. 356,451

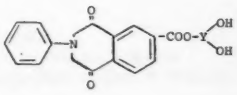
Claims priority, application Switzerland, May 14, 1969, 7362/69

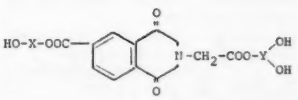
Int. Cl. C08g *22/06, 53/20*

U.S. Cl. 260—77.5 AQ **2 Claims**

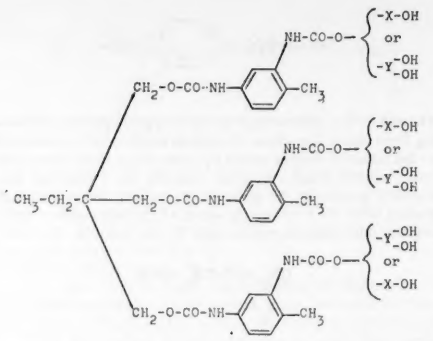
1. A varnish composition to be used for the manufacture of solderable enameled wires consisting essentially of the polyurethane reaction product of a hydroxyl compound A and an isocyanate compound B selected in respect to each other so that at least one thereof contains imide groups and reacted with each other in a stoichiometric ratio of the hydroxyl groups and isocyanate groups and wherein said compound A is selected from alcohols of the formulae:





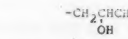


and

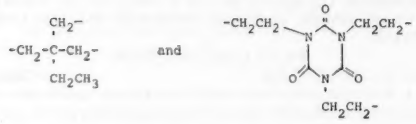


wherein X means

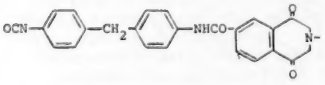
$-(CH_2)_m-$, $-(CH_2CH_2O)_n-CH_2CH_2-$ and

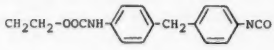


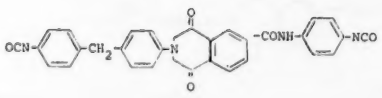
m being an integer from 2 to 4 and *n* being an integer from 1 to 2 and Y means

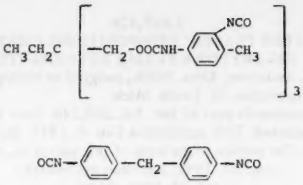


and the ratio X:Y is of from 1:2 to 2:1, and said compound B is selected from isocyanates of the formulae:









and mixtures thereof.

3,869,429

HIGH STRENGTH POLYAMIDE FIBERS AND FILMS

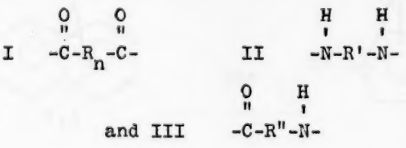
Herbert Blades, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 172,572, Aug. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 138,180, April 28, 1971, abandoned. This application June 30, 1972, Ser. No. 268,057

Int. Cl. C08g *20/20, 20/38*

U.S. Cl. 260—78 S **12 Claims**

1. Fiber or film of polyamide having an inherent viscosity of at least 2.5 as measured at a concentration of 0.5 gram of polymer in 100 ml. of concentrated sulfuric acid (95–98% H_2SO_4) at 30°C. and consisting essentially of recurring units selected from the group consisting of:



wherein units I and II, if present in the polymer are present in substantially equimolar amounts, R, R′ and R″ groups, which may be the same or different, are divalent radicals, *n* may be zero or the integer one and at least about 95 mol % of the total R, R′ and R″ radicals in the polymer are single rigid radicals with chain extended bonds or a series of such radicals which are linked together directly by chain extended bonds, said rigid radicals being selected from the group consisting of single ring and fused multiring aromatic carbocyclic radicals, 2,5-pyridylene, 4,8-quinolylene, trans-1,4-cyclohexylene, and 1,4-[2,2,2]-bicyclooctylene radicals, which rigid radicals may be linked by azo or azoxy groups, and trans-vinylene and ethynylene radicals, with the proviso that vinylene or ethynylene cannot serve as R′ or that portion of a R″ radical attached to

at least 75 mol % of the said rigid radicals being aromatic carbocyclic radicals, the chain extending bonds of such radicals being essentially coaxial or parallel and oppositely directed, said fiber or film having a filament or film tenacity of at least about 18 grams per denier, a filament or film elongation of at least 4.5 percent, and crystalline regions with a primary apparent crystallite size (PACS) of less than 52A as determined from an X-ray deffractogram scan along a lone perpendicular to the fiber or film axis using the equation:

$$PACS = \lambda/(\beta \cos \theta)$$

where λ represents the wavelength in A of the X-rays used; θ is the Bragg angle and β is the line breadth in radians, corrected for instrumental broadening, at half intensity of the major reflection located at the smallest value of 2θ.

3,869,430

HIGH MODULUS, HIGH TENACITY POLY(P-PHENYLENE TEREPHTHALAMIDE) FIBER

Herbert Blades, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 172,514, Aug. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 138,209, April 28, 1971, abandoned. This application June 30, 1972, Ser. No. 268,053

Int. Cl. C08g *20/20, 20/38*

U.S. Cl. 260—78 S 3 Claims

1. A high tenacity, high modulus fiber having a density of at least 1.40 grams per cubic centimeter and consisting essentially of poly(p-phenylene terephthalamide), the polymer of said fiber having an inherent viscosity of at least 4.0 as measured at a concentration of 0.5 gram of polymer in 100 ml. of concentrated sulfuric acid (95–98% H_2SO_4) at 30°C. and said fiber having 1) a lateral birefringence, Δn, of at least 0.022 as determined from measurements on oblique fiber sections of thickness, T, in microns, with a polarizing microscope equipped with a compensator, using the equation:

$$\Delta n = (K \lambda \sin 2\phi)/T$$

where K is the instrumental constant of the compensator, λ is the wavelength in microns of the light used and 2ϕ is the difference between the angles of the compensator to produce extinction along the minor and the major axis of the section, 2) crystalline regions with an apparent crystallite size, ACS, of greater than 58A as determined from an X-ray diffractogram scan along a line perpendicular to the fiber axis using the equation:

$$ACS = (K \lambda)/(\beta \cos \theta)$$

where K is taken as one; λ represents the wavelength in A of the X-rays used; θ is the Bragg angle and β is the line breadth in radians, corrected for instrumental broadening, at half intensity of the major reflection located at the smaller value of 2θ, and 3) an orientation angle no greater than 13° with the proviso that the ratio of the apparent crystallite size to the orientation angle is at least 6 A/degree.

3,869,431

POLYAMIDES AND THEIR PRODUCTION

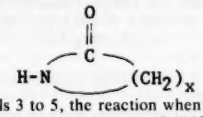
John Walter Spiewak, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 12, 1973, Ser. No. 340,125

Int. Cl. C08g *20/10*

U.S. Cl. 260—78 L 7 Claims

1. The process of producing a solid polyamide which comprises heating an aliphatic and/or aromatic amino-imide to liberate lactam and thus obtain polyamide, the lactam having the formula



in which x equals 3 to 5, the reaction when in the solid state being carried out at a temperature of 100° to 400° C., and when carried out in suspension in a solvent being carried out at a temperature of 100° C. to the boiling point of the solvent.

3,869,432

STYRENE-MALEIC ANHYDRIDE COMPLEX AND PROCESS FOR MAKING SAME

Norman G. Gaylord, New Providence, N.J., assignor to Champion International Corporation, New York, N.Y.

Division of Ser. No. 32,736, April 28, 1970, Pat. No. 3,765,934. This application Mar. 22, 1973, Ser. No. 343,924

Int. Cl. C08f *15/02*

U.S. Cl. 260—78.5 R 3 Claims

1. A process for forming a solid, stable, complex of styrene and maleic anhydride which comprises heating an equimolar mixture of styrene and maleic anhydride to a temperature sufficient to form a single phase composition and thereafter cooling said composition to below about 35°C.

3,869,433

ARYLENE SULFIDE POLYMERS

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,772

Int. Cl. C08g *23/00*

U.S. Cl. 260—79.1 18 Claims

1. A method of producing a polymer which comprises:

a. forming a composition by contacing at least one polyhalo-substituted aromatic compound wherein the halogen atoms are attached to aromatic ring carbon atoms, at least one base selected from the hydroxides of magnesium, calcium, strontium and barium and the carbonates of sodium, potassium, rubidium and cesium, at least one organic amide and at least one alkali metal bisulfide selected from bisulfides of lithium, sodium, potassium, rubidium and cesium; and,

b. maintaining at least a portion of said composition at polymerization conditions to produce said polymer.

3,869,434

SOLUBLE ARYLENE SULFIDE POLYMERS

Robert W. Campbell, and Lacey E. Scoggins, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,783

Int. Cl. C08g *23/00*

U.S. Cl. 260—79.1 15 Claims

1. A method of producing polymers which comprises:

a. contacting at least one m-dihalobenzene, at least one p-dihalobenzene, at least one alkali metal sulfide selected from the group consisting of sulfides of lithium, sodium, potassium, rubidium and cesium, and at least one organic amide to form a composition;

b. maintaining at least a portion of said composition at polymerization conditions to produce said polymer, said m-dihalobenzene being employed in an amount within the range of from about 35 to about 90 mole percent of the total moles of said m-dihalobenzene and said p-dihalobenzene with said m-dihalobenzene and said p-dihalobenze being contacted in an amount within the range of from about 0.9 to about 2 moles total per mole of said alkali metal sulfide; and

c. recovering said polymer.

3,869,435

METHOD FOR CROSS-LINKING RUBBER

Chester D. Trivette, Jr., Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1971, Ser. No. 200,595

Int. Cl. C08c *11/54*; C08d *9/00*; C08f *27/06*

U.S. Cl. 260—79.5 C 16 Claims

1. The method of cross-linking which comprises incorporating into diene rubber a cross-linking amount of

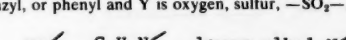
$$AccS\text{-}S_x\text{-}R\text{-}S_x\text{-}SAcc$$

where AccS is the same or different accelerating moiety, x is 1, 2, 3 or 4 and R is a divalent organic radical of 1 to 24 carbon atoms of the formula

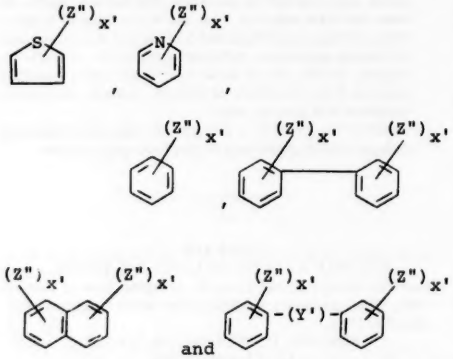
$$-(X)_n \quad -Y-(X)_n \quad -(Y-(X)_n \quad -)_m$$

where each *n'' independently is* 1 to 23, m is zero, 1 or 2, X is

where Z and Z' independently are hydrogen, alkyl, cycloalkyl, benzyl, or phenyl and Y is oxygen, sulfur, $-SO_2-$,

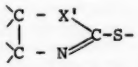


—C(O)O—, divalent cyclic radical each valence of which is on a ring carbon atom of an aliphatic ring said radical being the radical derived from removal of hydrogen from carbon in monocyclic, bi(monocyclic), bicyclic or tricyclic hydrocarbon or said hydrocarbon having up to two ring carbon atoms replaced by oxygen or divalent aromatic radical selected from the group consisting of anthrylene and radicals derived by removal of hydrogen from two ring carbon atoms of a compound of the formula



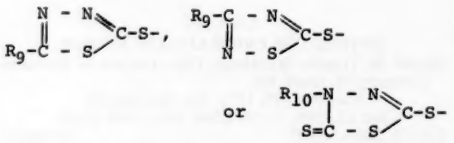
where each Z'' independently is hydrogen, lower alkyl, hydroxy, lower alkoxy, acetyl, phenyl, chloro or nitro, Y' is oxygen, sulfur, $-SO_2-$, —CO—, lower alkylene or lower alkylidene and *x' is* 1 to 4, where the accelerating moiety is selected from the group consisting of

1. radical of the formula



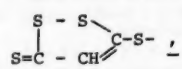
where the unsatisfied valences on the vicinal carbon atoms are satisfied independently by hydrogen, lower alkyl, benzyl, acetyl, carboalkoxy, phenyl, by one on each carbon together forming a double bond or by said carbon atoms being members of an unsubstituted aromatic or alicyclic ring, or aromatic ring substituted by a member of the group consisting of lower alkyl, halo, nitro, hydroxy, carboalkoxy, acetyl, lower alkoxy and phenyl and X' is S, O, or NH,

2. radical of the formula

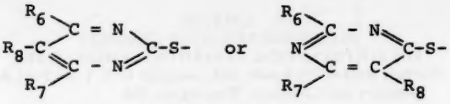


where R_9 is acetamido, lower alkyl, phenyl, chloro or bromo, and R_{10} is lower alkyl or phenyl,

3. radical of the formula

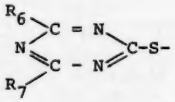


4. radical of the formula



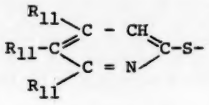
where R_6, R_7 and R_8 independently are hydrogen, lower alkyl, lower alkoxy, phenyl, nitro, chloro, lower alkylthio, lower alkylamino, lower dialkylamino, lower dialkenylamino, heterocyclic amino or R_7 and R_8 along with the adjacent carbon atoms to which they are attached form ortho arylene; and the corresponding dihydro and tetrahydro radicals,

(5) radical of the formula



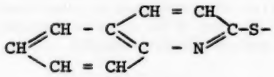
where R_6 and R_7 are independent and independently have the same meaning as before,

6. radical of the formula



where each R_{11} independently is hydrogen or lower alkyl, and

7. radical of the formula



and effecting cross-linking of the rubber.

3,869,436

METHOD FOR FRACTIONATING PLASMA PROTEINS USING PEG AND ION-EXCHANGERS

Falksveden, Lars-Gunnar Albinsson, Stockholm, Sweden, assignor to Statens Bakteriologiska Laboratorium, Solna, Sweden

Continuation of Ser. No. 148,541, June 1, 1971, abandoned. This application Oct. 5, 1973, Ser. No. 403,839

Int. Cl. C07g *7/00*

U.S. Cl. 260—112 B **5 Claims**

1. A method of fractionating plasma proteins, comprising the following steps:

a. removing blood corpuscles and cell fragments from the plasma in the blood;

b. precipitating the globulins in the plasma with polyethylene glycol having a molecular weight of approximately 6000 in a concentration of 10 to 15% by weight and at a pH of 6.5 to 8.0 at room temperature;

c. centrifuging out all of the precipitate from the remaining solution;

d. dissolving the precipitate at pH 5.8 in 0.05 M sodium acetate-acetic acid buffer and centrifuging out undissolved fibrinogen, plasminogen and IgM;

e. adsorbing the globulins from the solution containing β-lipoproteins, α-macroglobulins, lipids, precipitated albumin and IgG obtained in step (d) on carboxy methyl dextran cation exchanger at a pH of 5.8, thereby leaving in the solution the β-lipoproteins, α-macroglobulins, lipids, precipitated albumin and a lesser amount of IgG; and eluting the cation exchanger with 0.2 M sodium

chloride in 0.05 M phosphate buffer at pH 7.5 to 8.0 to obtain the adsorbed globulins including IgG;

f. precipitating the eluate from step (e) with additional polyethylene glycol at pH 6.5 to 8.0, centrifuging and dissolving the precipitate in 0.2 M phosphate buffer at pH 6.6;

g. adsorbing all the globulins in the solution from step (f) excluding IgG on an anion exchanger at pH 6.6;

h. cooling the IgG solution to −0.3°C. and precipitating IgG with ethanol in a concentration of 25% by volume of the total system at −5° to −10°C, said use of ethanol being the first use of ethanol in said process;

i. separating the precipitate, suspending and washing with 25% by volume ethanol at pH 7.0 at −5° to −10°C., and then renewing centrifuging;

j. dissolving in 0.1 M glycine and sterile-filtering; and

k. freeze-drying and preparing at 16 to 16.5% IgG solution in 0.3 M glycine for injection.

3,869,437

MONO-, DI, AND N^{A1}, N^{B1}, N^{B29}-TRI-ACYLATED INSULIN

David Gordon Lindsay, Hove, and Sydney Shall, Lewes, both of England, assignors to National Research Development Corporation, London, England

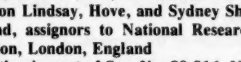
Continuation-in-part of Ser. No. 89,816, Nov. 16, 1970, abandoned. This application Aug. 21, 1973, Ser. No. 390,216

Claims priority, application Great Britain, May 8, 1970, 22342/70

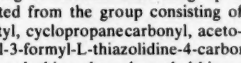
Int. Cl. C07c *103/52*; **C07g** *7/00*; **A61k** *17/02*

U.S. Cl. 260—112.7 **17 Claims**

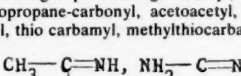
1. A physiologically-acceptable, substantially-pure mono-, di- or tri-substituted insulin in which the terminal amino group of the B chain (B_1 phenylalanine) is protected by an acyl or other blocking substituent containing up to seven carbon atoms selected from the group consisting of formyl, acetyl, trifluoroacetyl, cyclopropanecarbonyl, aceto-acetyl, benzoyl, 2,2-dimethyl-3-formyl-L-thiazolidine-4-carbonyl, carbamyl, methylcarbamyl, thiocarbamyl, methylthiocarbamyl,



$HOOCCH_2CO-$ and H_2NOCCH_2CO-, the terminal amino group of the A chain (A_1 glycine) is either free or protected by an acyl or other blocking substituent containing no more than four carbon atoms and no free primary amino group selected from the group consisting of formyl, acetyl, trifluoroacetyl, cyclopropane-carbonyl, acetoacetyl, carbamyl, methylcarbamyl, thio carbamyl, methylthiocarbamyl,



$NOCH_2CH_2CO-$, $HOOCCH_2CO-$ and $H_2NOC-CH_2CO-$ and the amino group of the B_{29} amino acid (lysine) is either free or protected by an acyl or other blocking substituent containing no more than four carbon atoms and no free primary amino group selected from the group consisting of formyl, acetyl, trifluoroacetyl, cyclopropanecarbonyl, acetoacetyl, carbamyl, methylcarbamyl, thiocarbamyl, methylthiocarbamyl,



$HOCH_2CH_2CO-$, $HOOC-CH_2-CO-$ and $H_2NOC-CH_2CO-$.

3,869,438

PROCESS FOR ISOLATING OIL-SEED PROTEINS USING LIQUID FLUOROCARBONS

John W. Finley; Earl Hautala, both of Martinez, Calif., and Charles E. Walker, Valley City, N. Dak., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 342,119, March 16, 1973, Pat. No. 3,828,017. This application May 20, 1974, Ser. No. 471,627

Int. Cl. A23j *1/14*

U.S. Cl. 260—123.5 **7 Claims**

1. A process for isolating protein from a pulverized oil seed, which comprises

a. forming a slurry of said pulverized oil seed in a liquid fluorocarbon containing sufficient low-density hydrocarbon solvent to provide a density of 1.35 to 1.45,

b. centrifuging the slurry to partition the components of the oil seed into separate fractions, including a protein fraction floating on said fluorocarbon liquid, and

c. collecting said protein fraction.

3,869,439

PIGMENTS COMPRISING SALTS OR COMPLEXES OF POLYVALENT METALS AND AZO-BARBITURIC ACID

Karl-Heinz Schundehutte, Opladen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 28, 1971, Ser. No. 213,221

Claims priority, application Germany, Dec. 28, 1970, 2064093

Int. Cl. C09b *45/18*, *45/20*, *45/22*

U.S. Cl. 260—146 D **4 Claims**

1. A polyvalent metal salt or a polyvalent metal complex of azo-barbituric acid; prepared from 1 mole of azo-barbituric acid and about ½ to about 3 moles of a polyvalent metal salt; wherein said polyvalent metal is selected from the group consisting of magnesium, barium, strontium, aluminum, zinc, manganese, iron, cobalt, nickel, copper and cadmium.

3,869,440

METAL-COMPLEX AZO DYESTUFFS CONTAINING A 5-UBSTITUTED-2,3-DIHYDROXYPYRIDINE AS COUPLING COMPONENT

Gerhard Back, Loerrach, Germany, and Alfred Fasciati, Bottmingen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

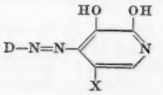
Filed Jan. 11, 1972, Ser. No. 217,041

Claims priority, application Switzerland, Jan. 14, 1971, 550/71

Int. Cl. C09b *45/14*, *45/18*, *45/20*

U.S. Cl. 260—146 R **9 Claims**

1. The heavy metal complex of an azo compound of the formula



where

D is the residue of a heterocyclic diazo component and is selected from pyridyl; benthiazolyl that is unsubstituted or substituted by chloro, nitro or methoxy; indazolyl that is unsubstituted or substituted by chloro, methoxy or nitro; triazolyl; carboxytriazolyl; 4-phenyl-5-methylpyrazolyl; 1-phenyl-2,3-dimethylpyrazolyl-5-one; benztriazolyl; benzimidazolyl; thiazolyl; methylthiazolyl; thiadiazolyl that is unsubstituted or substituted by phenyl, pyridyl, acetylamino, phenylsulphonyl, chloro, carbomethoxy, methylthio, ethylthio, phenylthio, cyclohexylthio, methylsulphonyl or methyl; quinolyl that is unsubstituted

or substituted by sulfo, chloro, bromo, acetylamino, methyl, sulfophenylazo, or sulfophenylazo containing a fibre-reactive acylamino group where acyl is selected from chloroacetyl, bromoacetyl, β-chloropropionyl, β-bromopropionyl, α,β-dichloropropionyl, α,β-dibromopropionyl, chloromaleyl, acrylyl, β-chloroacrylyl, β-bromoacrylyl, α-chloroacrylyl, α-bromoacrylyl, α, β-dichloroacrylyl, α,β-dibromoacrylyl, trichlorocrylyl, chlorocrotonyl and propiolyl; or benzisothiazolyl that is unsubstituted or substituted by methyl, ethyl, methoxy, chloro, bromo, cyano, nitro, N-methylsulphonamido, N,N-dimethylsulfonamido or methylsulfonyl; or

D is phenyl or naphthyl that contains an OH, NH_2 or COOH group in the position ortho-to the azo bond, said phenyl or naphthyl being further unsubstituted or substituted by chloro, bromo, nitro, cyano, lower alkyl, lower alkoxy, lower alkylsulphonyl, sulfonic acid, carboxylic acid, sulphonamide, N-lower alkyl-sulphonamide, N-lower hydroxyalkyl-sulphonamide, N,N-diethylsulphonamide, N,N-di(β-hydroxyethyl)-sulphonamide, phenylazo, naphthylazo, formylamino, acetylamino, benzoylamino, benzenesulphonamide, p-toluenesulphonylamino, methanesulphonylamino, carboxymethoxyamino, carboethoxyamino, dimethylamino-sulphonylamino or isopropoxyamino, and

X is hydroxy, alkoxy of 1 to 4 carbon atoms, phenoxy, naphthoxy, benzyloxy, amino, alkylamino of 1 to 4 carbon atoms, β-hydroxyethylamino, γ-methoxy-n-propylamino, isopropoxy-n-propylamino, N,N-diethylethylenediamine, cyclohexylamino, piperidyl, morpholyl, phenylamino, carboxyphenylamino, sulfonaphthylamino, mercapto, methylthio, β-hydroxyethylthio, phenylthio, carboxyphenylthio, naphthylthio, thiazolylthio, methylsulphonyl, phenylsulphonyl, methyl-phenylsulphonyl, sulfo or fibre-reactive acylamino where acyl is selected from the group consisting of chloroacetyl, bromoacetyl, β-chloropropionyl, β-bromopropionyl, α,β-dichloropropionyl, α,β-dibromopropionyl, chloromaleyl, acrylyl,β-chloroacrylyl, β-bromoacrylyl, α-chloroacrylyl, α-bromoacrylyl, α,β-dichloroacrylyl, α,β-dibromoacrylyl, trichloroacrylyl, chlorocrotonyl and propiolyl.

3,869,441
3-SECONDARY AMINOMETHYLENE-4-LOWER-ALKYL--AZO-6-HYDROXYPYRID-2-ONE DYESTUFFS

Nigel Hughes, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

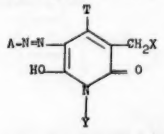
Filed Dec. 27, 1971, Ser. No. 212,634

Claims priority, application Great Britain, Jan. 4, 1971, 292/71

Int. Cl. C09b *29/36;* **D06p** *3/70*

U.S. Cl. 260—156 **3 Claims**

1. A water soluble salt of an azo dyestuff free from sulphonic or carboxylic acid group of the formula:



wherein

A is 2-nitrophenyl, 3-nitrophenyl, 4-nitrophenyl, 2-methoxy-4-nitrophenyl, 4-methoxy-2-nitrophenyl, 4-methyl-2-nitrophenyl, phenyl, 2-methylphenyl, 3-methylphenyl, 4-methylphenyl, 2-methoxyphenyl, 4-methoxyphenyl, 4-acetylaminophenyl, 2-chlorophenyl, 3-chlorophenyl, 4-chlorophenyl, 2-nitro-4-chlorophenyl, 2-chloro-4-nitrophenyl, 2-bromo-4-nitrophenyl, 4-sulphonamidophenyl, 4-(phenylazo)phenyl, 4-(2′-methylphenylazo)-2-methylphenyl, 1′-naphthyl-, 4-(2′,4′-dinitrophenyl)aminophenyl, 4-(phenylazo)-2-chlorophenyl, 4-(4′-methylphenylazo)-phenyl, 4-(2′-nitrophenylamino) phenyl, or 6-methyl-2-(4′-aminophenyl) benzthiazole;

T is methyl, ethyl, propyl or phenyl;

Y is hydrogen, methyl, ethyl, propyl, hydroxyethyl, methoxypropyl, 1-naphthyl, phenyl, p-tolyl, o-tolyl, p-methoxyphenyl, p-nitrophenyl, or p-chlorophenyl; and X is amino of the formula $—NR^1R^2$ wherein R^1 and R^2 each independently are methyl, ethyl, propyl, hydroxyethyl or cyanoethyl, or together with the nitrogen atom to which they are attached form a hetercycle selected from piperidino, morpholino, thiomorpholino, hexahydroazepino and 2-methylpyrrolidino, with an acid selected from the group consisting of hydrochloric, sulphuric, phosphoric, sulphamic, boric, formic, acetic, propionic, citric, oxalic, and mono-, di- and trichloroacetic acids.

3,869,442
PHENYL-AZO-N-ACYLAMIDOETHYLANILINE COMPOUNDS

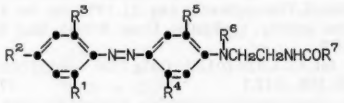
Max A. Weaver, and Clarence A. Coates, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1971, Ser. No. 194,047

Int. Cl. C09b *29/08, 31/04;* **D06p** *3/24*

U.S. Cl. 260—207.1 **8 Claims**

1. A compound having the formula



wherein

R^1 is hydrogen, chlorine, bromine, or lower alkylsulfonyl;

R^2 is phenylazo or lower alkylsulfonyl;

R^3 is hydrogen, chlorine or bromine;

R^4 is hydrogen, lower alkyl or the group —NHCOR⁷;

R^5 is hydrogen or lower alkyl;

R^6 is hydrogen, alkyl of up to about eight carbon atoms or cyclohexylmethyl; and

R^7 is lower alkyl; lower alkyl substituted with chlorine, hydroxy, lower alkoxy, cyano, carbamoyl, lower alkanoyloxy or cyclohexyl; lower alkoxy; cyclohexyl; phenyl; phenyl substituted with lower alkyl, lower alkoxy or chlorine; or 2-furyl.

3,869,443
N,N′-HEPTAMETHYLENEBIS(4-TRIFLUOROMETHOXYBENZAMIDE)-β-CYCLODEXTRIN INCLUSION COMPLEX

George Y. Lesher, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 119,029, Feb. 25, 1971, , which is a continuation-in-part of Ser. No. 62,186, Aug. 7, 1970, abandoned. This application May 29, 1973, Ser. No. 364,289

Int. Cl. C08b *25/02;* **C07c** *103/30*

U.S. Cl. 260—209 R **1 Claim**

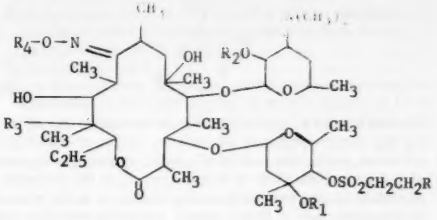
1. N,N′-Heptamethylenebis(4-trifluoromethoxybenzamide)-β-cyclodextrin inclusion complex.

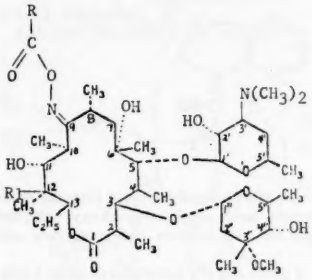
3,869,444
ESTERS OF ERYTHROMYCIN OXIME

Leslie Alan Freiberg, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 10, 1972, Ser. No. 296,431
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 E **14 Claims**

1. The compound 9-(0)-(2,6-dimethyl-4-carbomethoxy)benzoylerythromycin A oxime having the following general structural formula



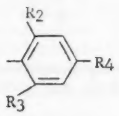


(desosamine)

(cladinose)

(erythronolide)

where R_1 is hydrogen or hydroxy, and R is a bulky alkyl group of 1–4 carbons, or a substituted aryl group, said substituted aryl group having the structural formula



where R_2 and R_3 are loweralkyl of 1–4 carbons and R_4 is selected from the group consisting of carboxamide, a C_1–C_4 alkyl, carboxyalkyl, carboxylic acid, aminoalkyl, substituted aminoalkyl, carboxyaminoalkyl, and salts of lower carboxylic acids.

3,869,445
4''-O-SULFONYL ERYTHROMYCIN-9-O-OXIME DERIVATIVES

Robert Hallas; John Soloman Tadanier, both of Waukegan, and Anne Mary VonEsch, North Chicago, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 356,988, May 3, 1973, abandoned. This application Dec. 10, 1973, Ser. No. 423,652
Int. Cl. Co7c *129/18*
U.S. Cl. 260—210 E **5 Claims**

1. A 4''-O-sulfonyl erythromycin-9-O-oxime derivative of the following structural formula:

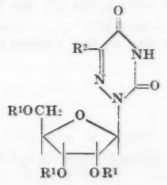
where R is selected from the group consisting of amino, monoalkyl amino, C_1–C_6 dialkyl amino, alkoxy, morpholino, piperazino, piperidino, C_1–C_6 alkylthio, C_1–C_6 alkylsulfonyl, arylthio, arylsulfonyl, thiamorpholino, aziridino, benzylthio, thiamorpholinosulfone, benzylsulfinyl, arylsulfinyl, benzylsulfonyl, cyanoalkyl, halocyanoalkyl, haloalkanoate, dialkanoate, ketoalkyl, ketoalkanoate, benzylamino, benzoxy, phenoxy, and benzylcyano; R_1 is hydrogen or methyl, R_2 is hydrogen or loweralkanoyl, R_3 is hydrogen or hydroxy, and R_4 is selected from the group consisting of a C_1–C_6 loweralkyl, cycloalkyl, aryl, and benzyl.

3,869,446
PROCESS OF PREPARING 6-AZAPYRIMIDINE RIBONUCLEOSIDES

Alois Piskala, Frantisek Sorm, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

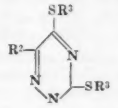
Filed Nov. 15, 1972, Ser. No. 306,838
Claims priority, application Czechoslovakia, Nov. 18, 1971, 8085-71; Nov. 23, 1971, 8163-71
Int. Cl. C07d *51/52*
U.S. Cl. 260—211.5 R **4 Claims**

1. Process of preparing 6-azapyrimide ribonucleosides according to the general formula I



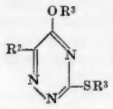
(I)

wherein R^1 is hydrogen or an acetyl or benzoyl and R^2 is hydrogen or an alkyl consisting of 1–6 carbon atoms, which process comprises treating 3,5-bis-alkylthio(or benzylthio)-1,2,4-triazines according to the general formula II



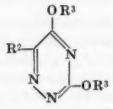
(II)

wherein R^2 is the same as in formula 1 and R^3 is an alkyl consisting of 1–6 carbon atoms or the benzyl group, at room temperature with an equimolar amount of alkali metal alkoxides, preferably sodium alkoxides, in alkanos consisting of 1–6 carbon atoms or in benzyl alkohol, thereby forming 5-alkoxy(or benzyloxy)-3-alkylthio(or benzylthio)-1,2,4-triazine according to the general formula III



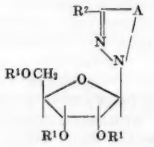
(III)

wherein R^2 and R^3 are the same as in formulae I and II, treating the latter compound III with an excess of alkali metal alkoxides, preferably sodium alkoxides, in alkanols consisting of 1–6 carbon atoms or in benzyl alcohol, in the presence of alkylating agents, preferably methyl iodide, or in the presence of anhydrous salts of heavy metals, preferably mercuric salts, at elevated temperatures, preferably at 60°–100°C, thereby forming 3,5-di-alkoxy(or benzyloxy)-1,2,4-triazines according to the general formula IV

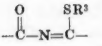


(IV)

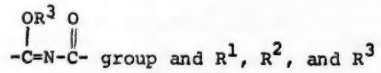
wherein R^2 and R^3 are the same as in formula II, condensing the aforesaid compounds III or IV with peracylribofuranosyl halides, thereby forming (from compounds III) the 2-(2,3,5-tri-O-acyl-β-D-ribofuranosyl)-3-alkylthio(or benzoylthio)-1,2,4-triazin-5(2H)-ones according to the general formula V



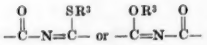
wherein A is a



group and R^1, R^2 and R^3 are the same as in formulae I and II, or forming (from compounds IV) the 2-(2,3,5-tri-O-acyl-β-D-ribofuranosyl)-5-alkoxy(or benzyloxy)-1,2,4-triazin-3(2H—ones according to the aforesaid general formula V, wherein A is a



are the same as in formulae I and II, dealkylating or hydrolyzing selectively the aforesaid compounds according to the general formula V, wherein A is the



group and R^1, R^2, and R^3 are the same as in formulae I and II, thereby forming the 6-azapyrimidime nucleosides according to the general formula I, wherein R^1 is an acetyl or benzoyl and R^2 is hydrogen or an alkyl consisting of 1–6 carbon atoms and converting the latter compounds, if required, by known procedure, namely, amonolysis or alcoholysis into compounds according to the general formula I.

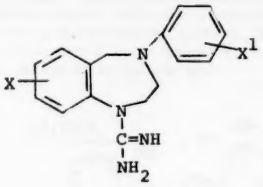
3,869,447

2,3,4,5-TETRAHYDRO-4-PHENYL-1H-1,4-BENZODIAZEPINE-1-CARBOXIMIDAMIDE AND RELATED COMPOUNDS

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

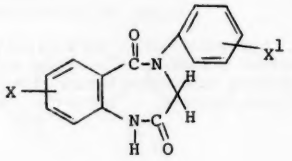
Filed May 13, 1974, Ser. No. 469,172
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 BD **7 Claims**

1. A compound of the formula



wherein X and X^1 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halo, and trifluoromethyl and the acid-addition and quaternary salts thereof.

7. The method of producing the compound of claim **1** comprising reducing a compound of the formula



with a strong reducing agent, converting this intermediate to its acid-addition salt form, and reacting with cyanamide by heating.

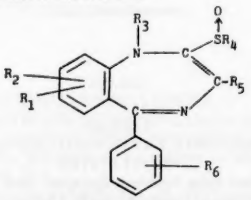
3,869,448

2-LOWER ALKYLSULFINYL-1H-1,4-BENZODIAZEPINES

James Valentine Earley, Cedar Grove; Rodney Ian Fryer, North Caldwell, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 187,836, Oct. 8, 1971,. This application June 5, 1974, Ser. No. 476,352
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 BD **1 Claim**

1. A compound of the formula



wherein R_1 and R_2 are each selected from the group consisting of hydrogen, halogen, trifluoromethyl and nitro; R_3 is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower cycloalkyl-lower alkyl and di-lower alkylamino-lower alkyl; R_4 is lower alkyl; R_5 is hydrogen or lower alkyl; R_6 is selected from the group consisting of hydrogen, and halogen

and the pharmaceutically acceptable acid addition salts thereof.

3,869,449

NEW PENICILLIN ESTERS, SALTS THEREOF, AND METHODS FOR THEIR PREPARATION

Wagn Ole Godtfredsen, Vaerlose, Denmark, assignor to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

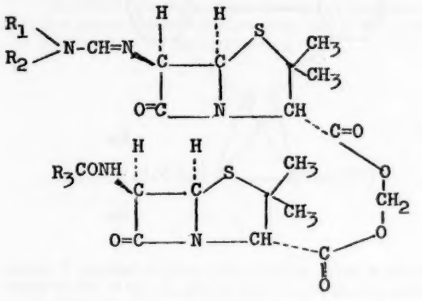
Filed Apr. 13, 1972, Ser. No. 243,855

Claims priority, application Great Britain, May 5, 1971, 13358

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **9 Claims**

1. A penicillin ester of the formula I



I

in which R_1 and R_2 together with the nitrogen atom to which they are attached represent hexahydroazepinyl; R_3 represents a member selected from the group consisting of benzyl, phenoxymethyl, 3-(2'-chloro-6'-fluorophenyl)-5-methyl-4-isoxazolyl,D(-)-alpha-azidobenzyl, D(-)-alpha-aminobenzyl and 3-(o-chlorophenyl)-5-methyl-4-isoxazolyl; and pharmaceutically acceptable, non-toxic salts thereof.

3,869,450

S-TRIAZOLO (4,3-D) (1,4) BENZODIAZEPIN-6(7H)-ONES

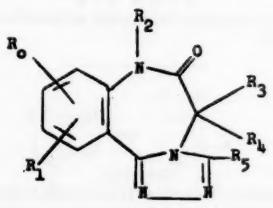
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed June 18, 1973, Ser. No. 370,917

Int. Cl. C07d *53/06, 55/00, 99/02*

U.S. Cl. 260—239.3 T **7 Claims**

1. A compound of the formula



wherein:

R_0 and R_1 each independently represent hydrogen, halo having an atomic weight of about 18 to 80, alkyl of 1 to 4 carbon atoms, nitro or trifluoromethyl provided that at least one of R_0 and R_1 is halo, preferably chloro, when R_2 is hydrogen, and

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, and

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, unsubstituted phenyl or phenyl mono-substituted with halo having an atomic weight of 18 to 80

R_4 is hydrogen, and

R_5 is unsubstituted phenyl or phenyl mono-substituted or disubstituted with halo having an atomic weight of 18 to 80, or a pharmaceutically acceptable acid addition salt thereof.

3,869,451

ANAESTHETIC STEROIDS OF THE PREGNANE AND 19-NORPREGNANE SERIES

Gordon Hanley Phillipps, Wembley; Christopher Earle Newall, London, and Barry Edward Ayres, Amersham, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

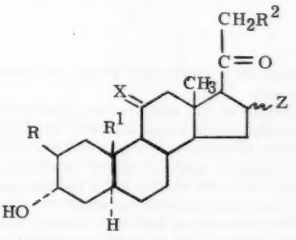
Filed Nov. 11, 1971, Ser. No. 197,915

Claims priority, application Great Britain, Nov. 12, 1970, 53911/70

Int. Cl. C07c *169/32*

U.S. Cl. 260—239.5 **21 Claims**

1. A 3α-hydroxy steroid of the pregnane or 19-norpregnane series selected from the group consisting of a compound of the formula



wherein:

R is a bromine, fluorine or iodine atom; (C_1–C_6) alkanoyloxy; (C_1–C_6) alkanoyloxy substituted with at least one of a halogen atom or a diethylamino, morpholino or piperidino group; (C_1–C_6) alkoxy; allyloxy; cyclohexyloxy; phenoxy; benzyloxy; (C_1–C_6) alkylthio; (C_1–C_6) alkoxy substituted by at least one of a halogen atom or hydroxy, (C_1–C_6) alkoxy, (C_1–C_6) alkoxycarbonyl, morpholino, tetrahydrofuranyl, or (C_1–C_6) alkanoyloxy substituted with at least one of a halogen atom or a diethylamino or morpholino group; alkyl containing up to 9 carbon atoms; hydroxy; nitrooxy; azido; or tosyloxy;

R^1 is hydrogen or methyl;

R^2 is hydrogen, halogen or (C_1–C_6) alkanoyloxy;

X is 2 hydrogen atoms or an oxo group; and

Z is 2 hydrogen atoms,

a hydrogen atom and a halogen atom, or a hydrogen atom and a (C_1–C_5) alkyl group; and its pharmaceutically acceptable 3α-(C_1–C_5) alkanoyl ester or such an ester substituted by at least 1 halogen atom or carboxy or diethylamino group and its 20-ethylene ketal, R^1 being hydrogen only when R is (C_1–C_6) alkoxy, X is oxo and Z is 2 hydrogen atoms.

3,869,452

14BETA,18-(EPOXYETHANOIMINO) STEROIDS

Hansuli Wehrli, Schaffhausen, and Oskar Jeger, Zollikerberg-/Zurich, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

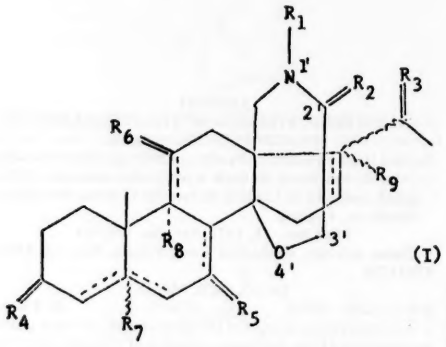
Continuation of Ser. No. 82,183, Oct. 19, 1970, abandoned. This application Oct. 19, 1972, Ser. No. 298,913

Claims priority, application Switzerland, Oct. 24, 1969, 15902/69; July 24, 1970, 11242/70

Int. Cl. C07c *173/10*

U.S. Cl. 260—239.55 R 14 Claims

1. A compound of the Formula I



(I)

wherein

R_1 represents a lower alkyl group, the benzyl group or hydrogen,

R_2 represents an oxo radical or two hydrogen atoms,

R_3 represents oxo or a ketal derived from a lower alkanediol or lower alkanols, or hydroxyl, hydroxyl esterified with a lower alkanoic acid or hydroxyl etherified with a lower alkanol or benzyl alcohol and a hydrogen atom,

R_4 represents oxo or a ketal derived from a lower alkanediol or lower alkanols, or hydroxyl, hydroxyl esterified with a lower alkanoic acid or hydroxyl etherified with a lower alkanol or benzyl alcohol and a hydrogen atom, or hydroxyl, hydroxyl etherified with a lower alkanol or benzyl alcohol and together with R_8 an epoxy radical,

R_5 and R_6 each independently represent oxo or a ketal derived from a lower alkanediol or lower alkanols, or hydroxyl, hydroxyl esterified with a lower alkanoic acid or hydroxyl etherified with a lower alkanol or benzyl alcohol and a hydrogen atom, or two hydrogen atoms, or, when occurring at a double bond, one hydrogen atom,

R_7 represents an α- or β-oriented hydrogen atom,

R_8 represents an α-oriented hydrogen atom, an α-oriented hydroxyl group, or together with R_4 an epoxy radical, and R_9 represents an α- or β-oriented hydrogen atom, or hydroxyl, hydroxyl esterified with a lower alkanoic acid or hydroxyl etherified with a lower alkanol or benzyl alcohol,

whereby double bonds may be present in the positions 5 or 4, when R_4 represents a free oxo radical, as well as 7, 9 (11) and 16 corresponding to the dotted lines with the elimination of R_7, R_8 and/or R_9,

as well as pharmaceutically acceptable acid addition salts of a compound of Formula I in which R_2 designates two hydrogen atoms with the exception of Batrachotoxinin A.

3,869,453

IRON CARBONYL COMPLEX OF AROMATIC AZO COMPOUNDS COMPLEXED WITH PARTICULAR PHOSPHINE ARSINE OR STIBINE COMPOUNDS

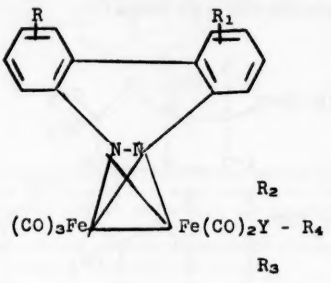
Robert Putnam Bennett, Bridgewater Township, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 154,667, June 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 775,188, Nov. 12, 1968, abandoned. This application Jan. 29, 1973, Ser. No. 327,270

Int. Cl. C07d *51/10*

U.S. Cl. 260—242 6 Claims

1. A diiron pentacarbonyl complex of a benzo(c)cinnoline having the formula:



wherein R and R_1 are hydrogen, methyl or halogen, Y is phosphorus, arsenic or antimony and R_2, R_3 and R_4 can be hydrogen or lower alkyl and at least one of R_2, R_3 or R_4 is not hydrogen.

3,869,454

NOVEL DIAZAMEROCYANINES AND THEIR USE FOR DYEING KERATINOUS FIBERS

Gerard Lang, Epinay-sur-Seine, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed June 5, 1972, Ser. No. 259,689

Claims priority, application France, June 4, 1971, 71.63287; Jan. 6, 1972, 72.64565

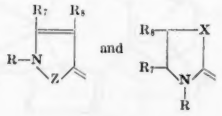
Int. Cl. C07d *87/22*

U.S. Cl. 260—244 R 2 Claims

1. A diazamerocyanine, including the mesomorphic form thereof, having the formula

$$A = N - N = B'$$

wherein A is a nitrogen heterocycle selected from the group consisting of



wherein:

R is lower alkyl having 1–4 carbon atoms or phenyl;

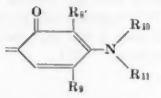
X is a member selected from the group consisting of oxygen, sulfur, —NR'—, where R' is lower alkyl having 1–4 carbon atoms; —CH=CH—;

where R'' is hydrogen or lower alkyl having 1–4 carbon atoms; or —C(R'')(R'')—, where R'' each independently have the meaning above;

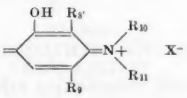
Z is —CH=CH— or —NR''', where R''' is lower alkyl having 1–4 carbon atoms

R_7 is hydrogen, lower alkyl having 1–4 carbon atoms, or phenyl;

R_8 is hydrogen or lower alkyl having 1–4 carbon atoms, or R_7 and R_8, when taken together with the carbon atoms to which they are attached form a benzene ring, a halogen-substituted benzene ring, a benzene ring substituted with lower alkyl having 1–4 carbon atoms, a benzene ring substituted with lower alkoxy having 1–4 carbon atoms, or a nitro-substituted benzene ring; and B' is a member selected from the group consisting of



and



where R_8 and R_{10}, together with the carbon and nitrogen atoms to which they are attached, form a morpholine group and R_9 is hydrogen and R_{11} is hydrogen or lower alkyl having 1–4 carbon atoms, or R_9 and R_{11}, together with the carbon and nitrogen atoms to which they are attached, form a morpholine group, and R_8 is hydrogen and R_{10} is hydrogen, lower alkyl having 1–4 carbon atoms and alkanoyl having 2 to 5 carbon atoms; and X^- is a halide, fluorborate, perchlorate, sulfate, disulfate or acetate anion.

3,869,455

PYRROLIDIDES AND MORPHOLIDES OF 4,5-DIPHENYL-OXAZOLE-2-ALKANOIC ACIDS

Enzo Marchetti, Rome, Italy, assignor to Instituto Farmacologico Serono S.p.A., Rome, Italy

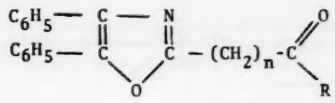
Filed Mar. 1, 1971, Ser. No. 119,832

Claims priority, application Italy, Mar. 5, 1970, 21550/70

Int. Cl. C07d *87/40*

U.S. Cl. 260—247.5 E **7 Claims**

1. A carboxylic acid amide of the formula:



wherein *n* is 0, 1 or 2 and R represents pyrrolidino or morpholino.

3,869,456

SYNTHESIS OF 5-PYRIMIDINECARBINOLS

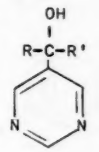
Harold M. Taylor; James D. Davenport, both of Indianapolis, and Ronald E. Hackler, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 234,339, March 13, 1972, which is a continuation-in-part of Ser. No. 888,949, Dec. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 829,844, May 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 685,315, Nov. 24, 1967, abandoned, which is a continuation-in-part of Ser. No. 634,074, April 27, 1967, abandoned. This application Dec. 13, 1973, Ser. No. 424,537

Int. Cl. C07d *51/18, 51/36*

U.S. Cl. 260—251 **5 Claims**

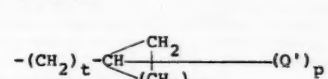
1. In the preparation of a 5-pyrimidinecarbinol of the formula

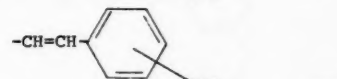


wherein R is

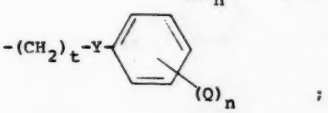
C_1-C_{12} alkyl,

C_2-C_{12} alkenyl,





, or



;

R' is

C_2-C_{12} alkyl,

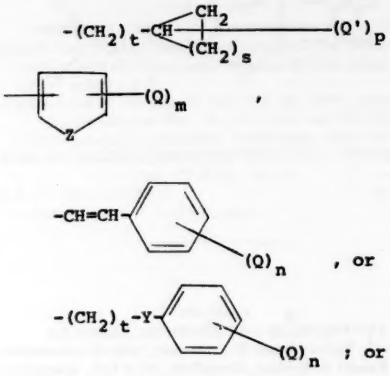
C_2-C_{12} alkenyl,

norbornen-2-yl,

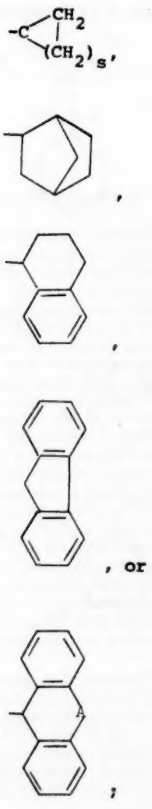
2-norbornyl,

adamantyl,

3-pyridyl,



R and R′, taken together with the carbon atom to which they are attached, form a ring of the formula



wherein

Q is C_1–C_4 alkyl, C_1–C_8 alkoxy, C_1–C_4 alkylthio, halo, hydroxy, trifluoromethyl, C_1–C_4 alkylsulfonyl, nitro, or di(C_1–C_4 alkyl)amino, or two Q's attached to adjacent carbon atoms of a benzene ring form a methylenedioxy group;

Q′ is C_1–C_4 alkyl or methoxy;

Y is oxygen, sulfur, or a carbon-to-carbon bond;

Z is oxygen or sulfur;

A is oxygen, sulfur, CH_2, CH_2—CH_2, or CH=CH;

n is 0 to 5;

m is 0 to 2;

p is 0 to 3;

s is 1 to 6; and

t is 0 to 5,

by the halogen-metal interchange between an alkyllithium and 5-bromopyrimidine followed by reaction of the intermediate 5-pyrimidyllithium with a ketone of the formula

wherein

R and R′ have the same significance as hereinabove, the improvement which comprises commingling 5-bromopyrimidine and the ketone at a temperature of from about −70° to about −125°C., and adding thereto an alkyllithium at such a rate that the reaction temperature remains below about −70°C.

3,869,457

2,3,5-SUBSTITUTED-6-TRIFLUOROMETHYL-1,3-DIAZIN-4-ONES

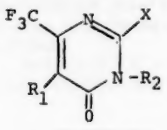
Albert William Lutz, Princeton, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanimid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 737,308, June 17, 1968, abandoned. This application Mar. 24, 1972, Ser. No. 237,936

Int. Cl. C07d *51/30, 51/38*

U.S. Cl. 260—260 **7 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen or halo

R_2 is alkyl of 1 to 12 carbon atoms, cyclohexyl, phenyl, allyl, mono or dihalo substituted alkyl of 1 to 12 carbon atoms, monocarb(loweralkoxy) substituted alkyl of 1 to 12 carbon atoms, mono or dihalo substituted phenyl, or mono or di CF_3 substituted phenyl, and

X is hydrogen or hydroxy and where X is hydroxy, the tautomers and water soluble sodium, potassium, ammonium and tri(C_1–C_4 alkyl) ammonium salts.

3,869,458

3'-O-ACETYL-18'-GLYCYRRHETYL-N-CARBOETHOXY PIPERAZINOAMIDES

John Cameron Turner, West Wickham, and Rosalind Po Kuen Chan, London, both of England, assignors to Biorex Laboratories, Limited, London, England

Filed July 8, 1970, Ser. No. 53,322

Claims priority, application Great Britain, July 28, 1969, 37692/69

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PC 2 Claims

1. 3'-O-acetyl-18β'-glycyrrhetyl-N-carboethoxy-piperazinamide.

3,869,459

N_1-(BENZOYL)ALKYL-N_2(PHENOXY-2-HYDROXY-PROPYL AND N_1-(BENZOYL)ALKYL-N_2-(PHENYLTHIO-2-HYDROXYLPROPYL) PIPERAZINE

Wolfgang Milkowski, Burgdorf; Horst Zeugner, Hannover; Klaus-Wolf Von Eickstedt, Isernhagen N. B., and Werner Stuhmer, Eldagsen, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

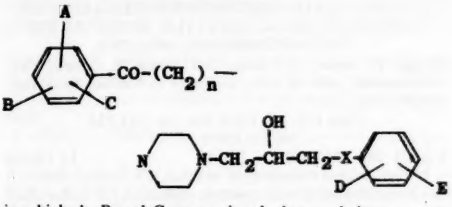
Filed Sept. 12, 1972, Ser. No. 288,321

Claims priority, application Germany, July 26, 1972, 2236679; Sept. 13, 1971, 2145683

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 R 45 Claims

1. A compound having the formula



in which A, B and C are each a hydrogen, halogen, or an alkoxy group, the alkyl moiety of which has up to 4 carbon atoms, D and E are each a hydrogen, halogen, trifluoromethyl, nontertiary alkyl, or alkanoylamino group, the alkyl moiety of which has up to 4 carbon atoms, or a nonadjacent nitro group, X is oxygen or sulfur, and n is 2 or 3, and pharmaceutically acceptable acid addition salts thereof.

3,869,460

I-ADAMANTYL CARBONYL-3,3-DIPHENYLPIPERAZINES

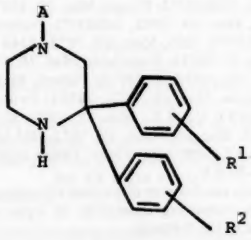
Meier E. Freed, Paoli, and Scott J. Childress, Philadelphia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 161,322, July 9, 1971, Pat. No. 3,749,725, which is a division of Ser. No. 786,367, Dec. 23, 1968, Pat. No. 3,631,047. This application Apr. 4, 1973, Ser. No. 347,940

Int. Cl. C07d *51/72*

U.S. Cl. 260—268 PC 2 Claims

1. A compound having the formula:



Where A is adamantylcarbonyl; and R^1 and R^2 are the same or different members selected from the class consisting of hydrogen, halogen, lower alkyl and lower alkoxy.

3,869,461

INTERMEDIATES FOR QUININE, QUINIDINE AND DERIVATIVES THEREOF

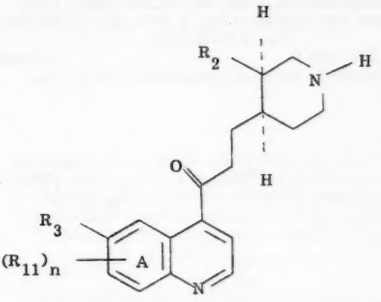
Juerg Albert Walter Gutzwiller, Bettingen, Switzerland, and Milan Radoje Uskokovic, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 212,648, Dec. 27, 1971, Pat. No. 3,753,992, which is a continuation-in-part of Ser. No. 104,785, Jan. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 837,304, June 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 741,913, July 2, 1968, abandoned. This application Apr. 26, 1973, Ser. No. 354,838

Int. Cl. C07d *33/50*

U.S. Cl. 260—284 20 Claims

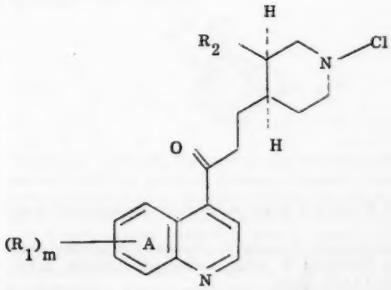
1. A compound of the formula



IIIc

wherein *n* is 1 or 2; R_2 is ethyl or vinyl; R_{11} is hydrogen, hydroxy, methyl, ethyl, propyl, butyl, methoxy, trifluoromethyl, or chloro, or when *n* is 2, R_{11} taken together with an adjacent R_{11}, is also methylenedioxy; when R_{11} is hydrogen, R_3 is methyl, ethyl, propyl, butyl, trifluoromethyl, or chloro; when R_{11} is other than hydrogen and *n* is 1, R_3 is methoxy, methyl, ethyl, propyl, hydrogen, trifluoromethyl, or chloro, or taken together with an adjacent R_{11}, is methylenedioxy; and when R_{11} is other than hydrogen and *n* is 2, R_3 is hydrogen, antipodes or racemates thereof.

10. A compound of the formula



IV

antipodes or racemates thereof,
wherein m is 0 to 2; R_1 is hydrogen, hydroxy, halogen, methyl, ethyl, propyl, butyl, methoxy or trifluoromethyl, or when m is 2, R_1, taken together with an adjacent R_1, is also methylenedioxy; and R_2 is ethyl or vinyl.

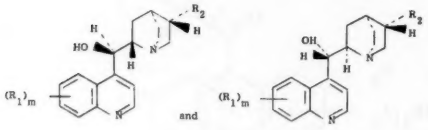
3,869,462

PROCESSES AND INTERMEDIATES FOR QUININE, QUINIDINE, ISOMERS AND DERIVATIVES THEREOF

Juerg Albert Walter Gutzwiller, Bettingen, Switzerland, and Milan Radoje Uskokovic, Upper Montclair, N.J., assignors to Hoffman-LaRoche Inc., Nutley, N.J.

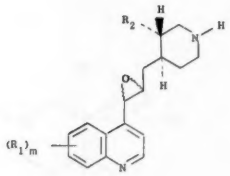
Division of Ser. No. 212,774, Dec. 27, 1971, Pat. No. 3,772,302, which is a continuation-in-part of Ser. No. 164,784, Jan. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 837,354, June 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 741,914, July 2, 1968, abandoned. This application Aug. 1, 1973, Ser. No. 384,767
Int. Cl. C07d *33/50*
U.S. Cl. 260—288 R **2 Claims**

1. A process for preparing compounds of the formulas



and

wherein m is 0, 1 or 2; R_1 is hydrogen, hydroxy, chloro, trifluoromethyl, methyl, methoxy, ethyl, propyl or butyl, or when m is 2, R_1, taken together with an adjacent R_1, is also methylenedioxy; and R_2 is vinyl or ethyl; their antipodes and racemates,
comprising the step of treating a compound of the formula



wherein R_1, R_2 and m are as above its antipode and racemate
with a weak organic or inorganic protonic acid selected from the group consisting of water, ammonium chloride, lower alkanols and Lewis acids.

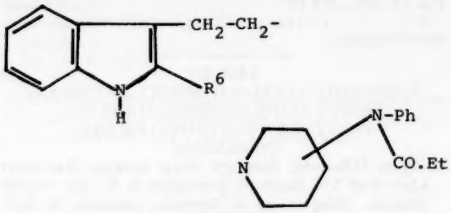
3,869,463

N-PHENYL DERIVATIVES OF ALKANOYLAMIDO PIPERIDINES

John Leheup Archibald, Windsor, England, assignor to John Wyeth & Brother Limited, Maidenhead, Berkshire, England

Filed Jan. 17, 1973, Ser. No. 324,462
Int. Cl. C07d *31/42*
U.S. Cl. 260—293.61 **4 Claims**

1. A compound selected from the group consisting of compounds having the formula



and the pharmaceutically acceptable acid addition salts of the said compounds, in which R^6 is selected from hydrogen and methyl.

3,869,464

PREPARATION OF 1-ALKYL-1,4-DIHYDRO-7-SUBSTITUTED-4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLIC ACIDS VIA THE 3-HYDROXYMETHYL ANALOGS

George Y. Lesher, Schodack, and Monte D. Gruett, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,734
Int. Cl. C07d *31/36*
U.S. Cl. 260—295.5 B **12 Claims**

1. The process consisting of reacting 1,4-dihydro-4-oxo-7-Q-1,8-naphthyridine with aqueous formaldehyde under alkaline conditions to produce, 1,4-dihydro-3-hydroxymethyl-4-oxo-7-Q-1,8-naphthyridine, reacting the latter with a lower-alkylating agent to produce 1-(lower-alkyl)-1,4-dihydro-3-hydroxymethyl-4-oxo-7-Q-1,8-naphthyridine, and reacting said 1-(lower-alkyl)-3-hydroxymethyl compound with an oxidizing agent capable of converting $-CH_2OH$ to $-COOH$ to procude 1-(lower-alkyl)-1,4-dihydro-4-oxo-7-Q-1,8-naphthyridine-3-carboxylic acid, where Q is lower-alkyl, lower-alkanoyloxymethyl, 4(or 3)-pyridyl or 4(or 3)-pyridyl having one or two lower-alkyl substituents.

3,869,465

DISPERSIONS OF POLYMER FLUORINE-CONTAINING ACRYLIC ACID DERIVATIVES

Karl Waldmann, Frankfurt/Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Continuation-in-part of Ser. No. 238,521, March 27, 1972, abandoned. This application Aug. 2, 1973, Ser. No. 385,070
Claims priority, application Germany, Mar. 29, 1971, 2115139; Belgium, Mar. 29, 1972, 115698; Great Britain, Mar. 27, 1972, 162068/72; France, Mar. 29, 1972, 72.11000; Great Britain, Mar. 29, 1972, 14803/72; Netherlands, Mar. 24, 1972, 7203992; Italy, Mar. 27, 1972, 22441/72; Japan, Mar. 28, 1972, 47-30431; Yugoslavia, Mar. 28, 1972, 834/72; Austria, Mar. 27, 1972, 2610/72; Poland, Mar. 28, 1972, 154380; Romania, Mar. 28, 1972, 70302; Switzerland, Mar. 27, 1972, 4530/72; U.S.S.R., Mar. 27, 1972, 2039; Mar. 28, 1972, 1767499; Hungary, Mar. 29, 1972, HO 1465
Int. Cl. C08f *3/64, 45/24;* **D06m** *15/00*
U.S. Cl. 260—29.6 F **11 Claims**

1. An aqueous emulsion or dispersion of a polymeric acrylic acid derivative consisting essentially of equal or different recurring units of the formula

$$X\text{-}C_aF_{2a}\text{-}L\text{-}CO\text{-}\underset{|}{C}G^1\text{-}CHG^2\text{-}$$

in which *a* is a number of 4 to 14, X is hydrogen or fluorine, L is a group of the formula

$-(CH_2)_k-O-$,
$-Z-NR-(CH_2)_i-O-$,
$-Z-NR-CH_2)_k-NR-$ or

$$-CH_2\underset{|}{C}H-(CH_2)_m-Q-$$
$$(CH_2)_p-O-CO-R$$

in which Q is oxygen or sulfur, R is hydrogen or lower alkyl, Z is —CO— or $-SO_2-$, *h* is a number of 1 to 12, *i* is a number of 2 to 6, *k* is a number of zero to 4 and *m* and *p* are numbers of 1 to 10;

G^1 is hydrogen, chlorine, methyl, cyano or a group of the formula

$$-CH_2-COOG$$

in which G is hydrogen, lower alkyl or fluoroalkyl of the formula

$$-L-C_aF_{2a}-X$$

in which *a*, L and X are as defined above; and

G^2 is hydrogen or a group of the formula

$$-COOG$$

in which G is as defined above;

obtained by emulsion polymerization of acrylic acid derivatives of the formula

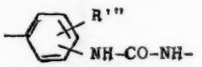
$$X-C_aF_{2a}-L-CO-CG^1=CHG^2$$

in which *a*, X, L G^1 and G^2 are as defined above, with the aid of about 0.5 to about 25% by weight, referred to the content of solid substance of a Bunte salt as an emulsifier of the formula

$$X-C_aF_{2a}-(CHR^1)_b-(O)_c-(Z)_d-(NR)_e-(E)_f-(CH_2)_g-SO_3M$$

in which X, R, Z and *a* are as defined above, R^1 is defined as R, *b*, *c*, *d*, *e* and *f* are zero, 1 or 2, *g* is a number of 1 to 12, E is a group of the formula

$-CH_2-CH_2-O-$,
$-CH_2-CHOH-$,
$-CH_2-CH_2-O-CO-NH-$ or



wherein R''' is methyl or a group of the formula

$$-NH-CO-C_aF_{2a}-X$$

in which *a* and X are as defined above; or, if *g* is different from 2, E is further —CO— or $-SO_3-$, and M is an alkali metal or an ammonium ion.

3,869,466

4-CYANO-3,5-ISOTHIAZOLEDIYLBIS(THIOMETHYLENE)DITHIOCYANATE

Craig E. Mixan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 30, 1973, Ser. No. 384,156
Int. Cl. C07d *91/12*
U.S. Cl. 260—302 S **1 Claim**

1. 4-Cyano-3,5-isothiazolediylbis(thiomethylene)dithiocyanate.

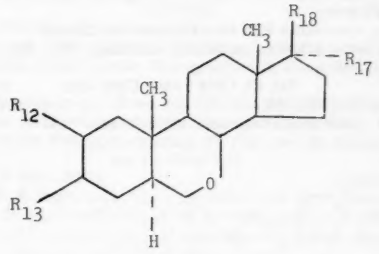
3,869,467

17-β-HYDROXY-17-α-METHYL-5-α-ANDROSTANO[3,2-C]OR [2,3-D]ISOXAZOLES

Robert William Guthrie, Fairfield; Richard Wightman Kierstead, and Ronald Andrew LeMahieu, both of North Caldwell, all of N.J., assignors to Hoffmann-LaRoche, Inc., Nutley, N.J.

Filed June 5, 1972, Ser. No. 259,526
Int. Cl. C07d *85/22*
U.S. Cl. 260—307 D **3 Claims**

1. A compound of the formula:



wherein R_{18} is hydroxy, or hydroxy esterified with trifluoroaceticacid or lower alkanoic acid where the lower alkanoic acid has from 2 to 6 carbon atoms; R_{17} is hydrogen or lower alkyl having from 1 to 7 carbon atoms; and R_{12} taken together with R_{13} from isoxazole.

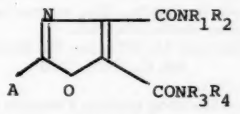
3,869,468

2-SUBSTITUTED OXAZOLE-4,5-DICARBOXAMIDES

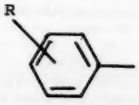
Giorgio Tarzia, Roma, Italy, assignor to Gruppo Lepetit S.p.A., Milan, Italy

Filed Nov. 6, 1972, Ser. No. 304,001
Claims priority, application Italy, Nov. 15, 1971, 31096/71
Int. Cl. C07d *85/44*
U.S. Cl. 260—307 R **13 Claims**

1. A compound represented by the formula



wherein A represents cyclohexyl, 2-thienyl or a group corresponding to the formula



wherein R represents p-phenyl or one to three substituents selected from the group of hydrogen, hydroxy, lower alkyl, halo, halo-lower alkyl, and lower alkoxy; R_1 and R_3 are selected from the group of hydrogen, lower alkyl, lower alkenyl, 5 to 8 carbon atom cycloalkyl, phenyl, phenyl-lower alkyl, hydroxy-lower alkyl, 2 to 4 carbon atom straight-chain alkanoyloxy-lower alkyl, hydroxy, amino, lower alkylideneamino, 5 to 8 carbon atom cycloalkylideneamino and

benzylideneamino; R_2 and R_4 are selected from the group of hydrogen, lower alkyl, lower alkenyl, 5 to 8 carbon atom cycloalkyl, phenyl, phenyl-lower alkyl, hydroxy-lower alkyl, 2 to 4 carbon atom straight-chain alkanoyloxy-lower alkyl; each of the pairs R_1R_2 and R_3R_4 are the same; and each of the pairs R_1, R_2 and R_3, R_4 may also form with the amino nitrogen atom pyrrolidinyl, piperazinyl, piperidinyl or morpholinyl.

3,869,469

7-TRIAZOLYL-3-ARYL COUMARIN COMPOUNDS

Otto Neuner, and Alfons Dorlars, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

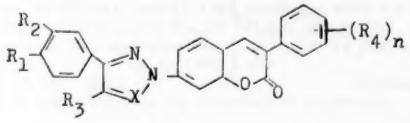
Filed Feb. 15, 1972, Ser. No. 226,528

Claims priority, application Germany, Dec. 10, 1971, 2161343

Int. Cl. C07d *99/04;* **C09k** *1/02*

U.S. Cl. 260—308 A **5 Claims**

1. Coumarine compounds of the formula



in which

R_1' represents phenyl, phenoxy, benzyloxy or cyclohexyl;

R_2' denotes hydrogen or together with R_1' forms a $-(CH_2)_4-$radical or $-CH=CH-CH=CH-$radical,

R_3' denotes methyl, ethyl, propyl, isopropyl, phenyl or cyclohexyl which can be substituted by methyl or chlorine;

R_4' denotes hydrogen, methyl, chlorine, nitrile, COOH, methoxy carbonyl, ethoxy carbonyl, hydroxy ethoxy carbonyl or methoxy ethoxy carbonyl;

n represents the number 1 or 2 and

X is N.

3,869,470

DEHYDROGENATION OF PYRROLIDINES

Ernest A. Zuech, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 31, 1973, Ser. No. 384,378

Int. Cl. C07d *27/00*

U.S. Cl. 260—313.1 **8 Claims**

7. A process according to claim **1** wherein a mixture of at least cis- and trans-2,5-dimethylpyrrolidine are dehydrogenated in the presence of the catalyst.

3,869,471

ALPHA-THIOCYANOACETAMIDES

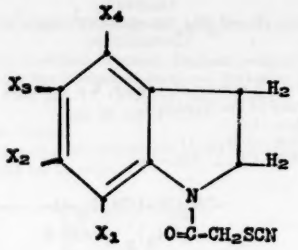
Sidney B. Richter, Chicago, and Alfred A. Levine, Skokie, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 165,348, July 22, 1971, Pat. No. 3,723,439, Continuation-in-part of Ser. No. 732,822, May 29, 1969, abandoned. This application Aug. 28, 1972, Ser. No. 284,295

Int. Cl. C07d *27/38*

U.S. Cl. 260—326.11 R **2 Claims**

1. A compound of the formula



wherein X_1, X_2, X_3 and X_4 are independently selected from the group consisting of hydrogen, lower alkyl, chlorine, bromine, trifluoromethyl, lower alkoxy and nitro provided that only one of X_1, X_2, X_3 and X_4 is nitro or tertiary lower alkyl and that at least two of X_1, X_2, X_3 and X_4 are hydrogen.

3,869,472

3-INDOLYL ALIPHATIC ACID DERIVATIVES

Hisao Yamamoto, Nishinomiya, and Masaru Nakao, Osaka, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

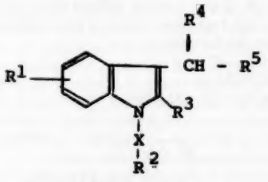
Division of Ser. No. 46,827, June 16, 1970, Pat. No. 3,743,004, which is a division of Ser. No. 622,076, March 10, 1967, Pat. No. 3,544,563. This application Dec. 6, 1972, Ser. No. 312,717

Claims priority, application Japan, Mar. 15, 1966, 41-16236; Mar. 18, 1966, 41-17085; Jan. 24, 1967, 42-4951

Int. Cl. C07d *27/56*

U.S. Cl. 260—326.12 A **15 Claims**

1. A compound of the formula



wherein R^1 is a hydrogen atom, a halogen atom, an alkoxy group having 1 to 2 carbon atoms, an alkylthio group having 1 to 2 carbon atoms or an alkyl group having 1 to 3 carbon atoms; R^2 is phenyl, halophenyl, pyridyl, furyl, thienyl or pentadienyl; R^3 and R^5 are respectively carboxy groups or alkoxycarbonyl group having 2 to 5 carbon atoms; R^4 is a hydrogen atom or an alkyl group having 1 to 2 carbon atoms; and X is a carbonyl or sulfonyl group.

3,869,473

METHOD FOR THE PREPARATION OF 3-(3'-CARBOXY-4'HYDROXY-1-NAPTHYL)-3-(3''-CARBOXY-4''HYDROXY-1''-NAPTHYL) NAPHTHALIDE

Yunn H. Chiang, Woburn, and John W. Sparks, Boston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 11, 1972, Ser. No. 314,097

Int. Cl. C07d *5/06*

U.S. Cl. 260—343.2 R **16 Claims**

1. A method of preparing 1-naphthol naphthalide indicator dyes which comprises:

A. reacting (a) about 1.0 to 1.5 moles of a 3-OX-3-(3'-lower carboalkoxy-4'-hydroxy-1'-naphthyl)naphthalide wherein X is an acyl radical of an organic mono- or dis-

carboxylic acid and (b) about 1.0 mole of a 2-carboxy-1-naphthol in an inert organic solvent at a temperature not exceeding about 85°C. in the presence of about 0.01 to 2.0 moles of non-water producing organic base having a pKa of not less than about 2 to form the corresponding 3-(3'-lower carboalkoxy-4'-hydroxy-1'-naphthyl)-3-(3''-carboxy-4''-hydroxy-1''-naphthyl)naphthalide dye precursor and

B. hydrolyzing said dye precursor to form the corresponding 3-(3'-carboxy-4'-hydroxy-1'-naphthyl)-3-(3''-carboxy-4''-hydroxy-1''-naphthyl)naphthalide dye product.

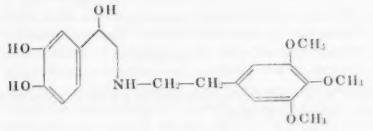
3,869,474

3,4-DIHYDROXY-BENZYLALCOHOL AMINO DERIVATIVES

Yuji Miura, Kawaguchi; Taku Nagao, Warabi; Masanori Sato, Toda; Hiromichi Nakajima, Yono, and Masazumi Kawanishi, Tokyo-to, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed July 22, 1971, Ser. No. 165,374
Claims priority, application Japan, Aug. 7, 1970, 45-69536
Int. Cl. C07c *91/16*
U.S. Cl. 260—343.7 **2 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof.

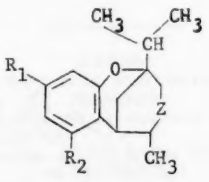
3,869,475

2,6-METHANO-BENZOXACIN COMPOUNDS

Raphael Mechoulam, Jerusalem; Shlomo Houry, Ramat-Gan, both of Israel, and Bernard Loev, Broomall, Pa., assignors to Yissum Research Development Company, Jerusalem, Israel, by said Mechoulam and Houry and SmithKline Corporation, Philadelphia, Pa., by said Loev

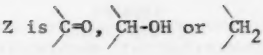
Continuation-in-part of Ser. No. 348,421, April 5, 1973, abandoned. This application Oct. 11, 1973, Ser. No. 405,343
Int. Cl. C07d *7/20*
U.S. Cl. 260—345.2 **6 Claims**

1. A compound of the formula:



in which:

one of R_1 and R_2 is hydroxy and the other is straight or branched alkyl having 5 to 12 carbon atoms and

Z is 

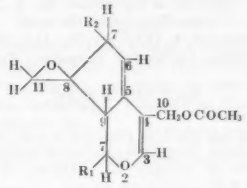
3,869,476

THERAPEUTICALLY ACTIVE ISOVALERIC ACID ESTERS

Peter Willibrord Thies; Walter Kucaba, both of Hannover, and Siegfried Funke, Hannover-Kirchrode, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Continuation-in-part of Ser. Nos. 339,581, Jan. 23, 1964, Pat. No. 3,422,090, and Ser. No. 385,021, July 24, 1964, abandoned. This application Sept. 27, 1967, Ser. No. 676,667
Int. Cl. C07d *7/20*
U.S. Cl. 260—345.2 **4 Claims**

1. A therapeutically active isovaleric acid ester selected from the group consisting of the isovaleric acid ester of the empirical formulae $C_{22}H_{30}O_8$, $C_{22}H_{32}O_8$ and $C_{24}H_{32}O_{10}$, respectively, and of the structural formula



in which one of the two radicals R_1 and R_2 is isovaleroxy and the remaining one of R_1 and R_2 is isovaleroxy or acetoxyisovaleroxy and the ester wherein both R_1 and R_2 are isovaleroxy and the 5,6-position is dihydrosaturated.

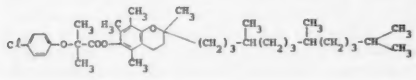
3,869,477

TOCOPHERYL-P-CHLOROPHENOXYISOBUTYRIC ACID ESTER

Hideyasu Shindo, Tokyo; Toshio Kumagai, Kawagoe, and Kengo Dot, Miyoshi, all of Japan, assignors to Kowa Yakuhin Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Jan. 30, 1973, Ser. No. 328,021
Claims priority, application Japan, Feb. 4, 1972, 47-12672
Int. Cl. C07d *7/22*
U.S. Cl. 260—345.5 **1 Claim**

1. α-tocopheryl p-chlorophenoxyisobutyrate of the formula



3,869,478

(2,3-DIHYDRO-2-BENZOFURANYLMETHYL)AMINOGUANIDINES

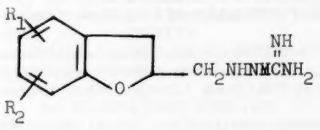
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 204,309, Dec. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 723,234, April 22, 1968, Pat. No. 3,700,697. This application July 30, 1973, Ser. No. 383,715

Int. Cl. C07d *5/36*

U.S. Cl. 260—346.2 R **3 Claims**

1. A compound of the formula



where R_1 and R_2 are each hydrogen, halo, lower-alkyl or lower-alkoxy.

3,869,479

REMOVAL OF IMPURITIES DURING THE RECOVERY OF CRUDE PHTHALIC ANHYDRIDE

Hans Dieter Barth, Gruner, and Erich Brand, Maarweg, both of Germany, assignors to Chemiebau, Dr. A. Zieren GmbH & Co., K.G., Cologne-Braunsfeld, Germany

Filed Feb. 8, 1971, Ser. No. 113,278

Claims priority, application Germany, Feb. 7, 1970, 2005628

Int. Cl. C07c *63/18*

U.S. Cl. 260—346.4 **12 Claims**

1. In a cyclical process for recovering solid phthalic anhydride in a separator from a gas containing phthalic anhydride vapor obtained by catalytic air oxidation of o-xylene in contact with a V_2O_5 containing catalyst, comprising continuously repeating in sequence the steps of: (a) passing said gas containing phthalic anhydride vapor over cooled heat exchange tubes to precipitate solid phthalic anhydride on the surfaces thereof; (b) passing a hot fluid having a temperature of about 145°–190°C through said heat exchange tubes to heat the surfaces thereof to at least 130°C and melt off resultant precipitated phthalic anhydride; (c) collecting resultant molten phthalic anhydride from said heat exchange tube surfaces; and (d) cooling said heat exchange tube surfaces by passing a fluid having a temperature of about **45°–55°C** therethrough; the improvement comprising flushing said heat exchange tube surfaces at the heat transfer surfaces thereof proximate to the gas outlet side of said separator towards the end of at least one step (b) with externally added molten phthalic anhydride having a temperature of 130°–280°C, whereby there is substantially prevented a buildup in difficult-to-remove, firmly adhering deposits of impurities which otherwise would cause a shut-down in the process.

7. In a cyclical process of recovering solid phthalic anhydride in a separator from a gas containing phthalic anhydride vapor obtained by catalytic air oxidation of naphthalene in contact with a V_2O_5 containing catalyst, comprising continuously repeating in sequence of steps of: (a) passing said gas containing phthalic anhydride vapor over cooled heat exchange tubes to precipitate solid phthalic anhydride on the surfaces thereof; (b) passing a hot fluid having a temperature of about 145°–190°C through said heat exchange tubes to heat the surfaces thereof to at least 130°C and melt off resultant precipitated phthalic anhydride; (c) collecting resultant molten phthalic anhydride from said heat exchange tube surfaces; and (d) cooling said heat exchange tube surfaces by passing a fluid having a temperature of about 45°–55°C therethrough; the improvement comprising flushing said heat exchange tube surfaces at the heat transfer surfaces thereof proximate to the gas inlet side of said separator towards the end of at least one step (b) with externally added molten phthalic anhydride having a temperature of 130°–280°C, whereby there is substantially prevented a buildup in difficult-to-remove, firmly adhering deposits of impurities which otherwise would cause a shut-down in the process.

3,869,480

PROCESS FOR PREPARING SPIRO COMPOUNDS

Teruaki Mukaiyama, Tokyo; Moriaki Higo, and Harumi Katsuyama, both of Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

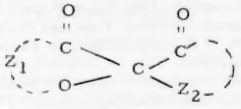
Filed Mar. 16, 1972, Ser. No. 235,320

Claims priority, application Japan, Mar. 17, 1971, 46-14842

Int. Cl. C07d *5/04*

U.S. Cl. 260—347.8 **10 Claims**

1. A spiro compound having the formula



wherein Z_1 is selected from the group consisting of $-CH_2)_n$, in which n is an integer of from 2 to 4;

with the CH_2 — end being attached to a keto carbon atom of the spiro compound; and

with the CH— end being attached to a keto carbon atom of the spiro compound; wherein Z_2 is a bonding group $-CH_2)_m$, in which m is an integer of from 3 to 6, forming an alicyclic paraffin ring.

3,869,481

17ALPHA-ALKANOYLOXY-6ALPHA-METHYL-3BETA-TRIALKYL-SILOXYPREGN-4-EN-20-ONES

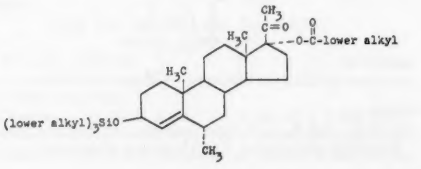
Paul B. Sollman, Wilmette, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 181,230, Sept. 16, 1971, abandoned. This application Nov. 23, 1973, Ser. No. 418,458

Int. Cl. C07c *169/32*

U.S. Cl. 260—397.4 **3 Claims**

1. A compound of the formula



3,869,482

METHOD OF PRODUCING HIGHLY PURIFIED PHOSPHATIDES

Werner Wolfe, Vienna, Austria, assignor to Etapharm chem. pharm. Laboratorium G.m.b.H., Wien XIX, Austria

Filed July 27, 1973, Ser. No. 383,041
Int. Cl. A23j *7/00*; **C07f** *9/02*
U.S. Cl. 260—403 **10 Claims**

1. A method for producing highly purified phosphatides from a total lipoid extract derived by organic solvent extraction from animal organs, said method comprising:

a. admixing a total lipoid extract which contains phosphatides with an alcohol-containing solvent having a boiling point which does not exceed 100°C and thereafter subjecting the lipoid extract to evaporation in vacuo at a temperature not greater than 40°C to present a dried phosphatide containing extract;

b. repeating step (a) a plurality of times to thereby prepare a multiple solvent extracted, dried phosphatide containing material;

c. mixing said multiple solvent extracted, dried, phosphatide containing material with petroleum ether and allowing such mixture to stand under the protection of an inert gas at freezing cabinet temperatures until proteins originally present in said dried material are precipitated;

d. separating precipitated proteins from the remainder of the mixture and removing the petroleum ether from the latter to thereby present a dry intermediate substance containing phosphatides which are contaminated with substantially less protein aceous matter than said multiply solvent extracted, dried, phosphatide containing material;

e. removing water-soluble substances from the phosphatides from which proteins have been separated in step (d) by admixing such phosphatides with a polar solvent which is incapable of permitting the formation of micellar structures from phosphatides, washing such admixture with neutral aqueous sodium salt solutions and water, and thereafter separating the polar solvent and water from the phosphatides which are thereby substantially free from water-soluble substances; and

f. mixing the phosphatides from which proteins have been separated in step (d) with a non-polar solvent in which phosphatides form miscellar structures, contacting the mixture of phosphatides and non-polar solvent with silica gel, and thereafter separating the non-polar solvent from the phosphatides which are thereby free of impurities capable of being adsorbed by said silica gel.

3,869,483

QUATERNARY AMMONIUM SALTS OF N-SUBSTITUTED PALMITAMIDES

Robert R. Mod; Frank C. Magne; Evald L. Skau, and Gene Sumrell, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 23, 1972, Ser. No. 265,869
Int. Cl. C07c *103/30*
U.S. Cl. 260—404.5 **3 Claims**

1. (2-palmitoylaminoethyl)propargyldimethylammonium bromide.

3,869,484

COATING COMPOSITION AND NOVEL COMPLEXER THEREFOR

Roger E. Burke, Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Dec. 4, 1972, Ser. No. 311,452
Int. Cl. C08h *17/36*
U.S. Cl. 260—404.5 **7 Claims**

1. A metal amine complexer, contained in an aqueous solution, consisting essentially of:

a. zinc;

b. from 0.9 to 6 moles, per mole of the metal, of a polyalkylene polyamine having the formula:

$$NH_2[(CHR)_aNH]_nH,$$

where a is from 2 to 3, n is from 2 to 5, and each R is selected from the group consisting of hydrogen and methyl; and

c. at least one aliphatic, monocarboxylic acid having from six to 18 carbon atoms.

3,869,485

PREPARATION OF ACID CHLORIDES WITH PHOSGENE IN THE PRESENCE OF A CATALYST

Richard C. DeLong, Snyder, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 25, 1969, Ser. No. 861,161
Int. Cl. C11c *3/00*
U.S. Cl. 260—408 **5 Claims**

1. A process for the preparation of a monocarboxylic acid chloride which comprises reacting a monocarboxylic acid or anhydride thereof with at least an equimolecular proportion of phosgene at a temperature between about 100° to about 180°C. in the presence of about 0.5 to 5 percent, by weight of the carboxylic acid or anhydride, of a catalyst selected from the group consisting of, methylbenzimidazole, and methylbenzotriazole.

3,869,486

IMPROVED MANGANESE ETHYLENE BISDITHIOCARBAMATE COMPOSITION

Krijn Van den Boogaart, and Meelis Nicolaus Louis, both of Vlaardingen, Netherlands, assignors to Penwalt Corporation, Philadelphia, Pa.

Filed July 16, 1973, Ser. No. 379,692
Claims priority, application Netherlands, July 18, 1972, 7209992
Int. Cl. C07f *13/00*
U.S. Cl. 260—429 K **16 Claims**

1. The process which comprises reacting in aqueous medium 0.90 to 0.99 mole of water-soluble salt of manganese with one mole of water-soluble salt of ethylene bisdithiocarbamic acid to form a precipitate of manganese ethylenebisdithiocarbamate in aqueous suspension containing unreacted water-soluble salt of ethylene bisdithiocarbamic acid, contacting said suspension with 2 moles to 25 moles of a water-soluble salt of zinc per mole of the unreacted salt of ethylene bisdithiocarbamic acid to precipitate zinc ethylenebisdithiocarbamate, and separating the diprecipitate product of manganese and zinc ethylenebisdithiocarbamates from the aqueous medium.

3,869,487

ALKYLTIN POLYSULFIDE THIOESTERS

Thomas G. Kugele, Cincinnati, and Robert E. Bresser, Sharonville, both of Ohio, assignors to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

Filed Sept. 24, 1973, Ser. No. 400,127
Int. Cl. C07f *7/22*
U.S. Cl. 260—429.7 **14 Claims**

1. A compound of the formula:

$$(R_xSn)_n(-SR'COOR'')_{(4-x)n-2m}(-S_y-)_m$$

where the tin is tetravalent, R is alkyl of 1 to 8 carbon atoms or benzyl, R′ is alkylene of 1 to 4 carbon atoms, R″ is alkyl of 1 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, cycloalkyl having 5 to 6 carbon atoms in the ring, x is 1 or 2, y is 2 to 4, n is 1 to 10 and m is 1/2 n to n.

3,869,488

WERNER CHROMIUM COMPLEXES AND METHODS FOR THEIR PREPARATION

John Edwin Bride, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 117,045, Feb. 19, 1971, abandoned. This application Jan. 29, 1973, Ser. No. 327,662

Int. Cl. C07f *11/00*

U.S. Cl. 260—438.5 C 20 Claims

1. A composition of a Werner complex of trivalent chromium atoms coordinated with acido groups of saturated aliphatic, hydroxy-containing, monocarboxylic acid having less than six carbon atoms and not more than three hydroxyl groups, and providing said complex composition with a ratio of total chromium atoms to total acido groups about within the range of 1:0.7 to 1:2.9, said complex composition being further characterized by containing coordinated chlorine atoms and having a ratio of total chromium atoms to total chlorine atoms about within the range of 1:0.1 to 1:2.3.

3,869,489

PROCESS OF MANUFACTURING TERT.-BUTYL P-TERT. BUTYLPERBENZOATE

Jacques Tiquet, and Jean-Louis Cros, both of Verneuil-en-Halatte, France, assignors to Societe Chimique des Charbonnages, Courbevoie, France

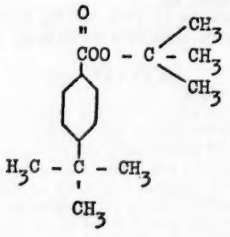
Filed July 3, 1973, Ser. No. 376,215

Claims priority, application France, July 5, 1972, 72.24371

Int. Cl. C07c *73/10*

U.S. Cl. 260—453 R 4 Claims

1. In a process for manufacturing tert. butyl-4-tert. butyl perbenzoate having the formula



comprising reacting 4-tert. butyl benzoic acid chloride with an aqueous alkaline solution of a tert. butyl hydroperoxide salt. the improvement comprising carrying out said reaction at a temperature between 40° and 45°C.

3,869,490

ESTERS

Gerhard Jager; Carl Metzger, both of Wuppertal-Elberfeld; Ludwig Eue, and Robert Schmidt, both of Cologne, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

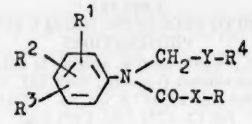
Filed June 23, 1972, Ser. No. 265,926

Claims priority, application Germany, July 9, 1971, 2134173

Int. Cl. C07c *155/02*

U.S. Cl. 260—455 A 30 Claims

1. N-aryl carbamic acid thiolester compound of the formula



(I)

R is aliphatic hydrocarbyl, halo-aliphatic hydrocarbyl or hydroxy-aliphatic hydrocarbyl of 1 to 8 carbon atoms;

R^1, R^2 and R^3 are individually hydrogen, alkyl of up to 4 carbon atoms, cycloalkyl of from 5 to 7 carbon atoms, alkoxy of from 1 to 4 carbon atoms, haloalkyl of up to 2 carbon atoms, or halogen;

R^2 and R^3 taken together represent a $-(CH)_4-$ grouping to form a fused benzene ring with the phenyl ring of formula I;

X is sulfur;

Y is oxygen;

R^4 is straight-chain or branched alkyl of from 1 to 18 carbon atoms, haloalkyl of from 1 to 6 carbon atoms, alkenyl of from 2 to 10 carbon atoms, haloalkenyl of from 2 to 6 carbon atoms, alkynyl or haloalkynyl of from 3 to 6 carbon atoms, formyl, alkoxyalkyl or alkylthioalkyl of from 1 to 4 carbon atoms in the alkoxy or alkylthio moiety and 2 to 4 carbon atoms in the alkyl moiety, alkoxycarbonylalkyl or alkylthiocarbonylalkyl of from 1 to 4 carbon atoms in the alkoxy or alkylthio moiety and 1 to 10 carbon atoms in the alkyl moiety, alkylcarbonylalkyl of from 1 to 4 carbon atoms in the alkylcarbonyl moiety and 1 to 10 carbon atoms in the alkyl moiety, optionally substituted cycloalkyl or cycloalkenyl of from 5 to 8 carbon atoms, aryl of from 6 to 10 carbon atoms in the aryl moiety, aralkyl of from 6 to 10 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the alkyl moiety, aroxyalkyl or arylthioalkyl of from 6 to 10 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the alkyl moiety, or R^4 can be the group

wherein

Z is oxygen and

R^6 is the same as R^4 except that R^6 cannot be the groups

and formyl.

3,869,491

HALOSULFONYL SULFOOXONIUM COMPOUNDS

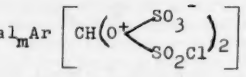
Victor Mark, and Carol A. Mark, both of Ransomville, N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Mar. 10, 1971, Ser. No. 123,015

Int. Cl. C07c *141/00*

U.S. Cl. 260—457 10 Claims

1. A compound of the formula



wherein Ar is benzene, Hal is independently selected from the group consisting of fluorine, chlorine, bromine and iodine, *n* is an integer selected from the group consisting of 1, 2 and 3 and *m*+*n* is 6.

3,869,492

DI-SUBSTITUTED BETA-PHENETHYLCARBAMIC ACID ESTERS

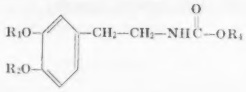
John Hans Biel, Lake Bluff, Ill., and Irwin L. Klundt, Brookfield, Wis., assignors to Aldrich Chemical Company, Milwaukee, Wis.

Division of Ser. No. 96,586, Dec. 9, 1970, Pat. No. 3,801,624. This application Aug. 2, 1973, Ser. No. 385,009

Int. Cl. C07c *125/06*

U.S. Cl. 260—463 **4 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or

R_3 being loweralkyl, loweralkenyl or loweralkynyl; R_2 is

and R_4 is loweralkyl, loweralkenyl, loweralkynyl, lowerhaloalkyl or cyclopropylmethyl, with the limitation that each R_3 cannot be ethyl when R_4 is ethyl.

3,869,493

NOVEL ODORANTS

Giuliano Bozzato, Kusnacht, and Mario Pesaro, Zurich, both of Switzerland, assignors to Givaudon Corporation, Clifton, N.J.

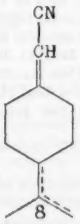
Filed Feb. 5, 1973, Ser. No. 329,789

Claims priority, application Switzerland, Feb. 12, 1972, 2097/72; Dec. 13, 1972, 18107/72

Int. Cl. C07c *121/48*

U.S. Cl. 260—464 **5 Claims**

1. Substituted-acetonitriles of the general formula



(I)

wherein the broken lines denote a double-bond emanating from the C_8-atom.

3,869,494

PRODUCTION OF TETRACHLOROPHTHALONITRILES

Robert D. Battershell, Plainsville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Aug. 7, 1972, Ser. No. 278,347

Int. Cl. C07c *121/56*

U.S. Cl. 260—465 G **24 Claims**

1. A process for the production of a tetrachlorophthalonitrile which comprises:

a. substantially completely reacting, in the liquid phase, a tetrachloroxylylenediamine and a chlorinating agent therefor to N,N,N′,N′-octachloroxylylenediamine;

b. dehycrochlorinating the resultant N,N,N′,N′-octachloroxylylenediamine; and

c. recovering tetrachlorophthalonitrile.

3,869,495

N-BENZYL-(2,2-DICYANOVINYL) ANILINES

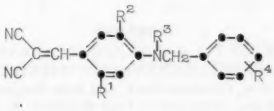
Max A. Weaver, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 23, 1972, Ser. No. 237,529

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 D **4 Claims**

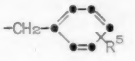
1. A compound having the formula



wherein

R^1 and R^2 are each selected from hydrogen and lower alkyl;

R^3 is cyclohexyl, benzyl, cyanoethyl, chloroethyl, or lower alkyl; [phenylethyl, phenyl, lower alkylphenyl, lower alkoxyphenyl, halophenyl, a group having the formula



in which R^5 is hydrogen or a substituent which R^4 can represent, or, when R^4 is lower alkoxycarbonyl, R^3 also can be lower alkyl or lower alkyl substituted with cyano, halogen, cyclohexyl or lower alkanoyloxy;]

R^4 is hydrogen, lower alkyl, lower alkoxy, halogen, or lower alkoxycarbonyl.

3,869,496

2,7-BIS-BASIC ESTERS AND ETHERS OF 9-BENZYLIDENEFLUORENCE

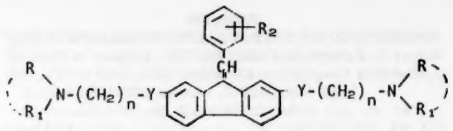
Edwin R. Andrews; George P. Claxton; Edward McC. Roberts, all of Cincinnati, Ohio, and Robert W. Fleming, Ann Arbor, Mich., assignors to Richardson-Merrell Inc., New York, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,138

Int. Cl. C07c *69/76, 121/78*

U.S. Cl. 260—465 E **9 Claims**

1. A 2,7-bis-basic derivative of 9-(substituted) benzylidenfluorene having the general formula:



wherein *n* is an integer of from 2 to 6; Y is selected from the group consisting of oxygen and the radical

R and R_1 are each selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the unsaturation is in a position other than in the 1-position of the alkenyl group, and when R and R_1 are taken together with the nitrogen atom to which they are attached represent the pyrrolidinyl, morpholino or piperidino radical; R_2 is selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and cyano; and the pharmaceutically acceptable acid addition salts thereof.

3,869,497

3,5-DITERT.BUTYL-4-(N-BENZOYLCARBAMYLOXY)-BENZYLIDENEMALONONITRILE

Roger P. Cahoy, Overland Park, and John Sanjean, Leawood, both of Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 236,341, March 20, 1972, Pat. No. 3,825,663, which is a continuation-in-part of Ser. No. 70,529, Sept. 8, 1970, Pat. No. 3,694,483. This application Aug. 31, 1973, Ser. No. 393,535

Int. Cl. C07c *121/70*

U.S. Cl. 260—465 D **1 Claim**

1. 3,5-ditert.butyl-4-(N-benzoylcarbamyloxy)-benzylidenemalononitrile.

3,869,498

WATER-INSOLUBLE STYRYL DYESTUFFS

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

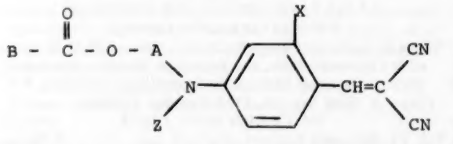
Continuation-in-part of Ser. No. 436,666, March 2, 1965, abandoned. This application Jan. 3, 1968, Ser. No. 695,346

Claims priority, application Switzerland, Mar. 9, 1964, 2993/64; Feb. 11, 1965, 1886/65

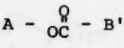
Int. Cl. C07c *121/60, 121/70*

U.S. Cl. 260—465 D **12 Claims**

1. A dyestuff of the formula



wherein X is methyl, methoxy or hydrogen; A is lower alkylene of 2 to 4 carbon atoms; Z is lower alkyl,



wherein A is as defined above, B' is benzyl, styryl, phenethyl, phenoxymethyl, phenyl, phenyl substituted by a member selected from the group consisting of chlorine, alkyl of 1 to 4 carbon atoms, lower alkoxy, hydroxy, carbo-lower-alkoxy; B is benzyl, phenethyl, styryl, phenoxymethyl, phenyl or phenyl substituted by a member selected from the group consisting of chlorine, alkyl of 1 to 4 carbon atoms, lower alkoxy, hydroxy, carbo-lower-alkoxy; and with the provision that when Z is lower alkyl, B is benzyl, phenethyl, phenoxymethyl or phenyl substituted by lower alkoxy and when Z is A — O — CO — B', B is a member selected from the group as defined above.

3,869,499

BIS(DICYANOPHENYL). ETHERS OF DIHYDRIC PHENOLS

Darrell R. Heath, and Joseph G. Wirth, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

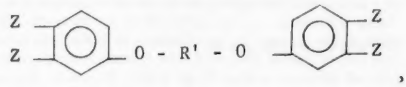
Division of Ser. No. 108,151, Jan. 20, 1971, Pat. No. 3,787,475. This application Jan. 12, 1973, Ser. No. 323,083

Int. Cl. C07c *121/74*

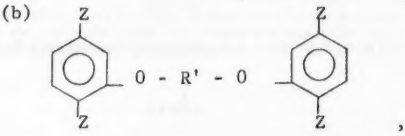
U.S. Cl. 260—465 F **8 Claims**

1. Compounds of the general formulas

(a)

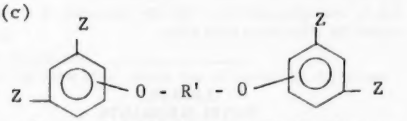


(b)



and

(c)



where each oxygen in (c) is adjacent to a Z radical in a commonly shared benzene nucleus and where R' is a divalent aromatic radical, Z is the -CN radical.

3,869,500

PROCESS FOR THE PRODUCTION OF UNSATURATED ALIPHATIC NITRILES

Naoya Kominami, Tokyo; Hitoshi Nakajima, Ageo; Seiji Miyata; Takeo Kimura, both of Tokyo; Masazumi Chono, Saitama, and Tokio Sakurai, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 206,541, Dec. 9, 1971, abandoned, which is a continuation of Ser. No. 807,976, March 17, 1969, abandoned. This application Aug. 21, 1973, Ser. No. 385,003

Claims priority, application Japan, Mar. 23, 1968, 43-18622

Int. Cl. C07c *121/04, 121/02*

U.S. Cl. 260—465.3 **14 Claims**

1. A process for the production of an ethylenically unsaturated aliphatic nitrile, which comprises contacting an olefin selected from the group consisting of ethylene, propylene, normal butylene, isobutylene and vinyl chloride with hydrogen cyanide and a molecular oxygen-containing gas in the gas

phase at a temperature of from 100° to 500°C, in the presence of a catalyst obtained by contacting a palladium metal, palladium oxide, palladium hydroxide or palladium salt with a member selected from the group consisting of hydrogen sulfide and sulfur dioxide at a temperature of from −10° to 1,200°C prior to contacting said catalyst with said olefin, said hydrogen cyanide and said molecular oxygen-containing gas.

3,869,501

PROCESS FOR PREPARING 3-PENTENENITRILE

Dhafir Yusuf Waddan, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 27, 1973, Ser. No. 392,008

Claims priority, application Great Britain, Sept. 7, 1972, 41487/72

Int. Cl. C07c *121/04*

U.S. Cl. 260—465.3 **7 Claims**

1. A process for the manufacture of 3-pentene nitrile which comprises reacting butadiene with hydrogen cyanide in the molar ratio 2:1 to 1:4 at a temperature within the range −25° to 200°C in the presence, as a sole catalyst, of from 0.0005 to 0.1 moles per mole of butadiene of cuprous chloride, bromide or iodide and a carboxylic acid selected from benzoic acid, oxalic acid and compounds having one or two carboxylic acid groups attached to a saturated or ethylenically unsaturated hydrocarbon residue containing up to three carbon atoms and which may be substituted by halogen.

3,869,502

CYCLOALIPHATIC ESTER POLYOLS

Anthony Joseph Papa, Saint Albans, W. Va., and William Robert Proops, Wilmington, Del., assignors to Union Carbide Corporation, New York, N.Y.

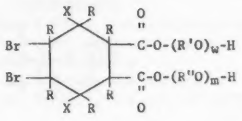
Filed Mar. 3, 1972, Ser. No. 231,751

Int. Cl. C07c *69/74*

U.S. Cl. 260—468 J **13 Claims**

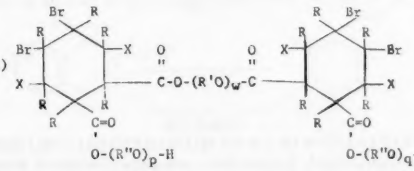
1. A bromine-substituted cycloaliphatic ester polyol which comprises at least one compound having the formula selected from the group consisting of:

(1)



and

(2)



wherein:

R represents hydrogen or an alkyl group having from 1 to 6 carbon atoms;

X, taken individually, represents hydrogen or an alkyl radical having from 1 to 6 carbon atoms and, when the two X groups of one or more of the cyclic nuclei are taken together, said two X groups represent a methylene bridge, $-CR_2-$, between the opposing carbon atoms, R being as aforesaid;

R′ and R″ respectively represent a bivalent alkylene radical having from 2 to 10 carbon atoms;

w represents a number having an average value from about one to about 15; and

m and the sum *p+q* respectively represent a number having an average value from about 0.1 to about 10, provided that when said bromine-substituted cycloaliphatic ester polyol is a mixture of compounds having said formulas (1) and (2), the average value of the sum *m+p+q* is no more than about 10.

3,869,503

SUBSTITUTED AMIDOPHENYLGUANIDINES

Arno Widdig, Blecher; Engelbert Kuhle, Bergisch Gladbach; Ferdinand Grewe, Burscheid; Helmut Kaspers, Leverkusen; Hans Scheinpflug, Leverkusen, and Paul-Ernst Frohberger, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

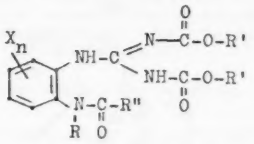
Filed Oct. 22, 1970, Ser. No. 83,159

Claims priority, application Germany, Jan. 8, 1970, 1955749

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **13 Claims**

1. Amidophenylguanidines of the formula:



(I)

in which:

each X independently denotes a halogen atom, lower alkyl lower loer alkoxy,

n denotes 0, 1 or 2,

R denotes a hhydrogen atom or lower alkyl,

R′ denotes alkyl with 1–12 carbon atoms, and

R″ denotes a hydrogen atom, alkyl with 1–18 carbon atoms which may be substituted by lower alkoxy, alkoxycarbonyl with 2–5 carbon atoms, phenoxy, or alkoxyphenoxy, cycloalkyl with 5–8 ring carbon atoms, or phenyl which may be substituted by halogen, lower alkyl or lower alkoxy.

3,869,504

HERBICIDAL METHYLPHENYL CARBAMATES

Gerhard Boroschewski, Wilkestrasse 15, Berlin 27, and Friedrich Arndt, Nackarttailfinger Strasse 102, Aich, both of Germany

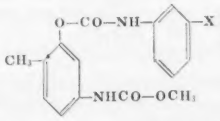
Filed Apr. 6, 1972, Ser. No. 241,801

Claims priority, application Germany, Apr. 27, 1971, 2121957

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **1 Claim**

1. Compounds having the general formula



wherein X is selected from the group consisting of chlorine and methyl.

3,869,505

DL-2-(4-HYDROXYPHENYL)-GLYCINE-N,O-DIACETATE AND SALTS

Derek Reginald Palmer, Wirral, England, assignor to Beecham Group Limited, Brentford, England

Filed Sept. 20, 1971, Ser. No. 182,190

Claims priority, application Great Britain, Sept. 24, 1970, 45463/70; Sept. 24, 1970, 45460/70; Sept. 24, 1970, 45461/70

Int. Cl. C07c *103/28*

U.S. Cl. 260—479 R **5 Claims**

1. DL-N-Acetyl-2-(4-acetoxyphenyl)-glycine.

3,869,506

1,2,10-TRICARBOXY PHENANTHRENE COMPOUNDS

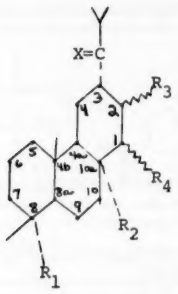
Tsung-Ying Shen, Westfield, and Howard Jones, Holmdel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 65,321, Aug. 19, 1970, abandoned. This application Oct. 5, 1972, Ser. No. 295,308

Int. Cl. C07c *61/30, 61/36, 131/02*

U.S. Cl. 260—514.5 **4 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, methyl, methoxycarbonyl, carboxy, hydroxymethyl, formyl or amino and R_2, R_3 and R_4 are each carboxy and X is $=H_2$, phenylhydrazino, =NOH or =O.

3,869,507

PREPARATION OF 5-FLUORO-2-METHYL-1-(P-METHYLSULFINYLBENZYLIDENE)-INDENYL-3-ACETIC ACID

Howard Jones, Holmdel, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 3, 1973, Ser. No. 402,943

Int. Cl. C07c *147/00*

U.S. Cl. 260—515 A **6 Claims**

1. A process of preparing 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-indenyl-3-acetic acid which comprises the steps of:

a. reacting 5-fluoro-2-methyl-indane-1,3-dione with anion of a dialkoxyphosphonoacetate or monoalkoxymonoaroxyphosphonoacetate to form 5-fluoro-2-methyl-ind-2-ene-1-one-3-acetic acid ester;

b. reacting said indanone acetate with a p-methylsulfinylbenzyl magnesium halide followed by dehydration or with a p-methylsulfinylbenzylidenephosphorane to form an ester of 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-indenyl-3-acetate; and

c. hydrolyzing said indenyl-3-acetate to form the desired product.

3,869,508

PROCESS OF PRODUCING ADIPIC ACID

Kermit D. Longley, Park Forest, and Donald Sprowl, South Holland, both of Ill., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Dec. 13, 1968, Ser. No. 792,882

Int. Cl. C07c *51/18, 55/14*

U.S. Cl. 260—531 R **7 Claims**

1. In a process of producing adipic acid by the molecular oxygen oxidation of cyclohexanol or cyclohexanone or mixtures thereof in a C_2 to C_6 saturated carboxylic acid solvent medium and in the presence of a catalyst, the improvement which consists in carrying out said oxidation in a main reaction vessel at a temperature in the range of about 100° to 150°F, and periodically or continuously adding to said reaction mixture in said main reaction vessel a distinctly minor portion of such a reaction mixture which has been heated to a temperature of at least about 25°F higher than that of the main reaction mixture while in contact with molecular oxygen, while maintaining the temperature of the reaction mixture in said main reaction vessed substantially within said range of 100° to 150°F, the additions of said heated distinctly minor portions of reaction mixture to the reaction mixture in the main reaction vessel serving to maintain the oxidation ratio at a high level.

3,869,509

N-ALKYL-N(TRIHALOMETHYLTHIO)-SULFAMIC ACID CHLORIDE

Engelbert Kuhle, Bergisch-Gladbach, and Erich Klauke, Odenthal-Hahnenberg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

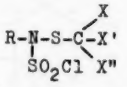
Filed Oct. 9, 1970, Ser. No. 79,669

Claims priority, application Germany, Oct. 23, 1969, 1953356

Int. Cl. C07c *143/70, 143/74*

U.S. Cl. 260—543 R **4 Claims**

1. N-alkyl-N-(trihalomethylthio)-sulfamic acid chloride of the formula:



(I)

in which:

R is alkyl with 1-4 carbon atoms, and

X, X′ and X″ each individually stand for fluorine or chlorine.

3,869,510

PREPARATION OF 3,5-DICHLOROBENZOYL CHLORIDE

Samuel Gelfand, Niagara Falls, and John C. Graham, Grand Island, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed May 25, 1973, Ser. No. 364,200

Int. Cl. C07c *51/58, 63/10*

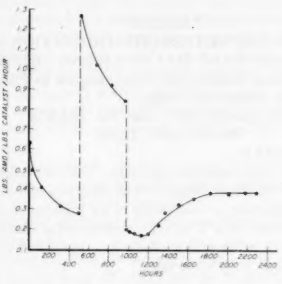
U.S. Cl. 260—544 M **8 Claims**

1. A process for the preparation of 3,5-dichlorobenzoyl chloride which comprises decarbonylating, in the liquid phase, 5-chloroisophthaloyl chloride in the presence of a catalytic amount of a compound selected from the group consisting of palladium chloride, palladium/barium sulfate, palladium-/aluminum oxide and mixtures thereof, at a temperature of not less than about 245 degrees centigrade.

3,869,511
IMPROVED CATALYTIC HYDRATION OF NITRILES

Robert Bird Johnson, Metairie, La.; David Henry Rakowitz, Cos Cob, Conn.; William Austin Barber, and John Allan Fetchin, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 20, 1972, Ser. No. 316,810
Int. Cl. C07c *103/08*
U.S. Cl. 260—561 N 6 Claims



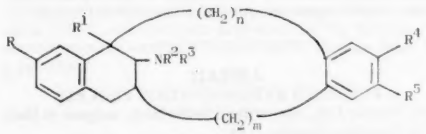
1. In a process of catalytic hydration of acrylonitrile with water to produce acrylamide, which process comprises contacting a reactant feed stream comprising the acrylonitrile and water with solid particulate catalyst comprising catalytic elemental copper freshly prepared by reduction of copper sulfate or copper chromium oxide, the improvement wherein chloride ion is present in said reactant feed stream in amount effective to at least inhibit the decay of catalyst activity as the catalytic hydration process proceeds.

3,869,512
DIBENZOBICYCLOALKANE AMINES AND RELATED COMPOUNDS

Elisabeth H. Freed; Meier E. Freed, both of Paoli, and John R. Potoski, Spring City, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,814
Int. Cl. C07c *91/42*, *93/14*, *119/14*, *131/00*, *49/76*
U.S. Cl. 260—571 9 Claims

1. A compound of the formula:



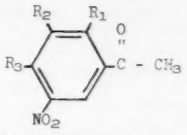
wherein R is hydrogen, hydroxy, lower alkyloxy, phenyl lower alkyloxy, lower alkyl phenyl lower alkyloxy, lower alkyloxy phenyl lower alkyloxy, halo, or trifluoromethyl; R^1 is lower alkyl of from 1 to 3 carbon atoms, lower alkenyl, or lower alkynyl; R^2 is hydrogen or lower alkyl; R^3 is hydrogen, lower alkyl, lower alkenyl, or lower alkynyl; R^4 and R^5 are identical and are hydrogen, hydroxy, lower alkyloxy, phenyl lower alkyloxy, lower alkyl phenyl lower alkyloxy, lower alkyloxy phenyl lower alkyl, or halo; or one of R^4 and R^5 is hydrogen and the other is hydroxy, lower alkyloxy, phenyl lower alkyloxy, lower alkyl phenyl lower alkyloxy, lower alkyloxy phenyl lower alkyloxy, halo, or trifluoromthyl; *m* is the integer 1 or2; and *n* is the integer 1 or 2 with the proviso that when *m* is 1, *n* is 1; and the pharmaceutically non-toxic addition salts thereof.

3,869,513
DINITRO-DIALKLYAMINO-ACETOPHENONES

Stanley J. Buckman, Memphis; Joseph G. E. Fenyes, Germantown; Kenneth J. Flangan, Memphis; John D. Pera and Miguel L. Pulido, both of Memphis, all of Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 261,751, June 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,476, Feb. 29, 1972, abandoned. This application July 13, 1972, Ser. No. 271,454
Int. Cl. C07c *97/10*
U.S. Cl. 260—577 4 Claims

1. A compound having the formula:



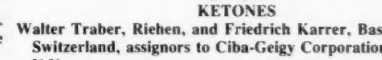
wherein R_1 or R_2 is nitro, R_1 or R_3 is dipropylamino, and one of R_1, R_2 and R_3 is hydrogen.

3,869,514
ASHLESS LUBRICATING OIL DISPERSANT

Edward F. Miller, and Walter W. Hellmuth, both of Beacon, N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 208,978, Dec. 16, 1971, Pat. No. 3,755,433. This application July 9, 1973, Ser. No. 377,661
Int. Cl. C07c *91/02*
U.S. Cl. 260—584 R 4 Claims

1. A composition represented by the formula:



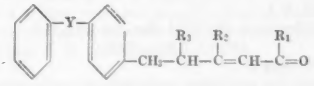
in which R and R′ represent hydrogen or a polyisobutenyl radical having an average molecular weight ranging from about 600 to 5,000, at least one of R and R′ being said polyisobutenyl radical.

3,869,515
KETONES

Walter Traber, Riehen, and Friedrich Karrer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 13, 1973, Ser. No. 396,958
Claims priority, application Switzerland, Sept. 22, 1972, 13866/72
Int. Cl. C07c *49/76*, *49/82*
U.S. Cl. 260—590 5 Claims

1. Compounds of the formula



wherein Y represents $-CH_2-$ or $-O-$, R_1 represents alkyl 1 to 4 carbon atoms, and $R_2$and R_3 each represents hydrogen, methyl, or ethyl.

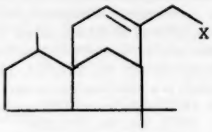
3,869,516
PROCESSES FOR THE PREPARATION OF CYCLIC ALDEHYDES

Wilhelmus J. Wiegers, Middletown, and John B. Hall, Rumson, both of N.J., assignors to International Flavors and Fragrances Inc., New York, N.Y.

Filed June 7, 1972, Ser. No. 260,537
Int. Cl. C07c *47/44*
U.S. Cl. 260—598 8 Claims

1. A process for the production of cyclic carbonyl compounds which comprises the step at reacting alpha-cedrene with a halogen at temperatures of from about 75° to 175°C to

obtain a halo derivative having the structure



and oxidizing the halo derivative with alkali metal salt of 2-nitropropane to obtain cedrenal, wherein X is chloro, bromo, or iodo.

3,869,517

PROCESS FOR PREPARING HYDROXY CITRONELLAL BY SAPONIFICATION OF THE HYDROXY ESTER

Peter S. Gradeff, Andover, and Claude Bertrand, Somerset, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

Filed Apr. 28, 1971, Ser. No. 138,359
Int. Cl. C07c *47/18*
U.S. Cl. 260—602 **18 Claims**

1. In the process for the preparation of hydroxy citronellal from citronellal, the improvement which comprises preparing an enol ester or diester or mixture thereof of citronellal by reaction with a lower alkanoic acid anhydride in the presence of an alkali metal lower alkanoic acid salt, hydrating the resulting enol ester or diester or mixture thereof in the presence of aqueous sulfuric acid having a sulfuric acid concentration within the range from about 58 to about 78% at a temperature within the range from about −20° to about 50°C., and then saponifying the hydroxy enol ester or diester to form hydroxy citronella with an aqueous solution of a strong base selected from the group consisting of the hydroxides, oxides and salts, which yield strong bases by hydrolysis in water, of the alkali metals and alkaline earth metals.

3,869,518

ACETALDEHYDE PRODUCTION

Morgan C. Sze, Upper Montclair, and Ruey H. Wang, Parsippany, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Sept. 27, 1971, Ser. No. 183,788
Int. Cl. C07c *45/02*
U.S. Cl. 260—604 R **19 Claims**

1. A process for producing acetaldehyde, comprising:

contacting a molten mixture comprising a multivalent metal chloride in both its higher and lower valence state and the corresponding oxychloride in an amount sufficient to provide oxygen requirements for acetaldehyde production to about 5.5 weight percent of the molten mixture, said multivalent metal being selected from the group consisting of copper, chromium, cobalt, manganese and iron with a gaseous feed comprising a hydrocarbon selected from the group consisting of ethane, ethylene and mixtures thereof and further comprising ethyl chloride and vinyl chloride in an amount sufficient to prevent net production thereof, said contacting being effected at a temperature from about 700° to about 1,000°F., in the essential absence of added chlorine and hydrogen chloride to produce a gaseous effluent comprising acetaldehyde.

3,869,519

FLUORINATED ETHER

Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 725,164, April 29, 1968, abandoned. This application Mar. 5, 1970, Ser. No. 17,008
Int. Cl. C07c *43/12*
U.S. Cl. 260—614 F **1 Claim**

1. The compound 1,1,1-trifluoro-2-difluoromethoxy propane of the formula $CHF_2OCH(CH_3)CF_3$.

3,869,520

PROCESS FOR DEHYDROHALOGENATION OF TRICHLOROETHANE TO VINYLIDENE CHLORIDE

Ronnie D. Gordon, Richardson, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 21, 1972, Ser. No. 265,074
Int. Cl. C07c *21/08*
U.S. Cl. 260—654 D **8 Claims**

1. A process for producing vinylidene chloride which comprises reacting trichloroethane with an alkali metal or alkaline earth metal hydroxide or carbonate in an aqueous medium at temperature as low as 0°C in the presence of a reaction aid, said reaction aid being activated carbon, activated charcoal, activated alumina, or porous silica.

3,869,521

AROMATIC HYDROGENATION USING SODIUM BOROHYDRIDE REDUCED TRANSITION METAL SUPPORTED CATALYSTS

Robert F. Benson, Fayetteville, Ark., assignor to Texaco, Inc., New York, N.Y.

Continuation of Ser. No. 158,581, June 30, 1971, abandoned. This application Dec. 29, 1972, Ser. No. 319,574
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 **10 Claims**

1. In a catalytic hydrogenation process of organic compounds selected from the group consisting of benzene, mono-alkylbenzene and mono-alkylnaphthalene to yield, in the case of benzene and mono-alkylbenzene, the corresponding cyclohexane and, in the case of mono-alkylnaphthalene, naphthalene and the corresponding alkane wherein the catalyst comprises a supported transition metal selected from, the group consisting of nickel, platinum, palladium and rhenium the improvement which comprises utilizing as the supported catalyst one prepared by impregnating a catalyst support with a solution of a transition metal salt, at least partially drying said support, contacting said support with a sodium borohydride solution until cessation of the evolution of gas and thereafter recovering the active transition metal supported catalyst.

3,869,522

AROMATICS HYDROGENATION PROCESS

Huno Van der Eijk, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed June 18, 1973, Ser. No. 371,024
Claims priority, application Netherlands, July 17, 1972, 7209847
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 **6 Claims**

1. A process for hydrogenating aromatic hydrocarbons which comprises contacting a low sulfur aromatics-containing petroleum distillate having a final boiling point below 375°C at a temperature of 100–400°C, a pressure of 10–200 bar, a space velocity of 0.5–15 $1.1^{-1}.h^{-1}$ and in the presence of hydrogen at a hydrogen/feed ratio of 50–4,000 $N1.1^{-1}$ with a catalyst having a pore volume of 0.3–1.2 ml/g and a surface area of 100–600 m^2/g and containing 0.5–5% wt Group VIII noble metals supported on a carrier comprising 30–90%wt silica, 10–70%wt zirconia and 0–25% wt alumina.

3,869,523
METHOD OF HYDROALKYLATING INCLUDING REGENERATION OF CATALYST

Robert M. Suggitt, Wappingers Falls, and John M. Crone, Jr., Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 320,215, Jan. 2, 1973,. This application Dec. 17, 1973, Ser. No. 425,403

Int. Cl. C07c *5/12*

U.S. Cl. 260—668 R **9 Claims**

1. The method of hydroalkylating a charge mononuclear aromatic hydrocarbon which comprises

passing said charge mononuclear aromatic hydrocarbon in the presence of a hydroalkylating quantity of hydrogen to a hydroalkylation operation containing hydroalkylation catalyst;

maintaining said hydroalkylation operation at hydroalkylation conditions thereby producing hydroalkylate product and a spent catalyst of decreasing catalytic activity;

decreasing the flow of charge mononuclear aromatic hydrocarbon;

heating said spent catalyst in the presence of hydrogen thereby regenerating said spent catalyst catalyst and formng regenerated catalyst;

cooling said regenerated catalyst to hydroalkylating temperatures; and

increasing the flow of charge mononuclear aromatic hydrocarbon thereby effecting further hydroalkylation.

3,869,524
PROCESS FOR THE PRODUCTION OF HEXAMETHYLBENZENE

Kenneth K. Light, Asbury Park, and James Brian Anglim, Matawan, both of N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Filed May 1, 1974, Ser. No. 466,067

Int. Cl. C07c *3/50*

U.S. Cl. 260—671 M **6 Claims**

1. A process for preparing hexamethylbenzene comprising the step of intimately admixing methyl chloride and a benzene derivative starting material selected from the group consisting of:

i. Pentamethyl benzene;
ii. Tetramethyl benzene;
iii. Trimethyl benzene;
iv. Xylene;
v. Toluene; and
vi. Benzene

and mixtures thereof in the presence of a solvent comprising a preponderance of orthodichlorobenzene, and a Friedel-Crafts catalyst at a temperature in the range of from 100° C up to 200° C and a benzene derivative starting material concentration in the orthodichlorobenzene of less than about 500 g per liter.

3,869,525
COMPOSITION COMPRISING A MIXTURE OF THERMOPLASTIC POLYMERS FOR INTERNAL CLEANING OF EXTRUDERS

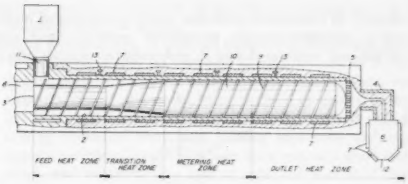
Donald N. Miller, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 248,958, May 1, 1972, Pat. No. 3,776,774. This application Aug. 6, 1973, Ser. No. 386,144

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 **8 Claims**

1. An extruder cleaning composition comprising a mixture of (1) discrete, crushable particles of a highly crystalline brittle thermoplastic first polymer having a high brittle point and (2) a thermoplastic second polymer which has a melting point below said brittle point and which upon heating above its said melting point forms a fluid-phase carrier for said particles, said highly crystalline polymer having a melting point up to about 350° C.



3,869,526
BIS(PHOSPHATES)

Malcolm Combey, Mellor Stockport, and Raymond Nicolson Birrell, Sale, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

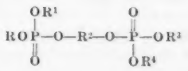
Filed June 11, 1973, Ser. No. 369,040

Claims priority, application Great Britain, June 13, 1972, 27501/72

Int. Cl. C07f *9/08*

U.S. Cl. 260—929 **6 Claims**

1. A compound of the formula



wherein

The R, R^1, R^3 and R^4 groupings are the same or different and each may be an alkyl radical containing from one to 15 carbon atoms, phenyl or alkylphenyl radical of six to 15 carbon atoms such that R, R^1, R^3 and R^4 are not all alkyl radicals nor are they all phenyl or alkylphenyl radicals containing six to eight carbon atoms, and

R^2 is a straight, branched or cyclic alkylene containing from two to six carbon atoms or a mono-di- or trioxaalkylene of four to 20 carbon atoms.

3,869,527
SECONDARY PHOSPHATE ESTERS

Bertil Hogberg; Hans Fex; Torsten Perklev; Sten Veige, all of Helsingborg, and Bo Fredholm, Nyhamnslage, all of Sweden, assignors to Aktiebolaget Leo, Halsovagen, Helsingborg, Sweden

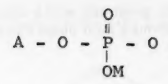
Filed Aug. 14, 1972, Ser. No. 280,538

Claims priority, application Great Britain, Aug. 17, 1971, 38577; Jan. 31, 1972, 4511. The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl. C07f *9/18;* **A01n** *9/36*

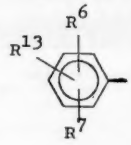
U.S. Cl. 260—946 **18 Claims**

1. A novel secondary phosphoric acid ester compound having the general formula

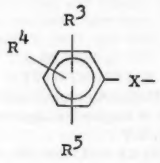


(I)

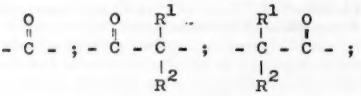
wherein M is selected from the group consisting of hydrogen and a pharmaceutically acceptable inorganic and organic cation; and wherein A and B, independent of each other, are



wherein one and only one of substituents substitutents R^6, R^7, and R^{13} always represents a group R, located in any of the meta and para positions relative to the phosphoric acid ester group, the group R having the formula



wherein X is selected from the group consisting of



wherein R^1 and R^2 are selected from the group consisting of hydrogen; lower alkyl; and lower alkenyl; wherein if R^1 is hydrogen R^2 may further be selected from the group consisting of cyclopentyl; cyclohexyl; phenyl; and phenyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and $—CF_3$; wherein R^3, R^4, R^5, R^6, R^7, and R^{13} above are selected from the group consisting of hydrogen; lower alkyl; lower alkenyl; lower alkoxy; hydroxy; —O—CO—R^{14}; —F; —Cl; —Br; and $—CF_3$; and wherein R^{14} is lower alkyl.

3,869,528

COLD TRANSIENT ENRICHMENT

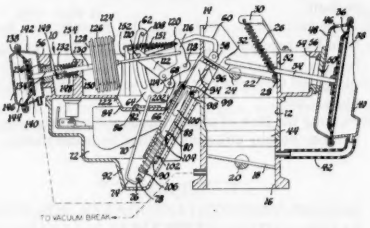
Stanley H. Mick, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1973, Ser. No. 343,556

Int. Cl. F02m *1/10*

U.S. Cl. 261—39 A **1 Claim**

1. The combination of a vacuum break unit and a cold transient enrichment device for use on an internal combustion engine having an induction passage for air flow to the engine, a throttle disposed in said induction passage for controlling air flow therethrough, metering means for supplying fuel to the engine in proportion to air flow through said induction passage, and temperature responsive means biasing said metering means to increase the proportion of fuel to air upon a decrease in temperature, said conbination comprising a first pressure responsive diaphragm adapted for connection to said metering means, means defining a chamber on one side of said diaphragm, means adapted for subjecting said chamber to the pressure in said induction passage downstream of said throttle whereby said diaphragm may bias said metering means to decrease the proportion of fuel to air in opposition to the bias of said temperature responsive means, means for subjecting said chamber to atmospheric pressure whereby said diaphragm is ineffective to oppose the bias of said temperature responsive means, each of said atmospheric pressure and induction passage pressure means including a valve seat and being disposed whereby said valve seats face one another, a valve member reciprocable between said valve seats, spring means biasing said valve member to engage the valve seat associated with said atmospheric pressure means and thereby obstruct flow therethrough, a second pressure responsive diaphragm connected to said valve member, said induction passage pressure means subjecting one side of said second diaphragm to the pressure in said induction passage downstream of said throttle, means defining a second chamber on the opposite side of said diaphragm, means including a valved orifice subjecting said second chamber to the pressure in said



induction passage downstream of said throttle, said valved orifice permitting a rapid decrease in pressure in said second chamber but a slow increase in pressure, whereby upon a decrease in said induction passage pressure said spring means is effective to bias said valve means into engagement with the valve seat associated with said atmospheric pressure means and said first diaphragm is subjected to said induction passage pressure, whereby for a selected period after an increase in induction passage pressure said second diaphragm is effective to overcome the bias of said spring means and pull said valve means into engagement with the valve seat associated with said induction passage pressure means and said first diaphragm is subjected to atmospheric pressure, and whereby after said selected period said spring means is again effective to bias said valve means into engagement with the valve seat associated with said atmospheric pressure means and said first diaphragm is again subjected to said induction passage pressure.

3,869,529

AIR CONDITIONING APPARATUS

Donald T. Follette, 98 Sleight Plass Rd., Poughkeepsie, N.Y. 12603

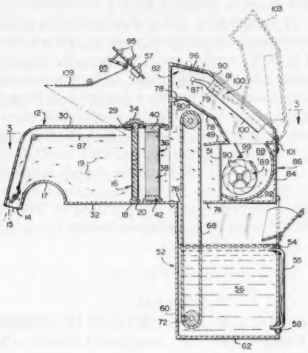
Filed Aug. 30, 1972, Ser. No. 284,909

Int. Cl. B01f *3/04*

U.S. Cl. 261—130 **7 Claims**

1. Air conditioning apparatus comprising a housing including an air inlet duct, a humidifier chamber, an air discharge duct and enclosing blower means for drawing air through said air inlet duct, said humidifier chamber and said air discharge duct, said air inlet duct having an air inlet port for communication with the ambient air and an outlet opening communicating with said humidifier chamber, an air filter for trapping dirt particles present in the ambient air fixedly positioned in said air inlet duct downstream from said air inlet port, an electric air heater fixedly positioned in said air inlet duct downstream from said air filter, a tank containing liquid disposed within said humidifier chamber, an endless liquid-transport belt rotatably mounted on a pair of vertically spaced rollers for rotating said belt with the flat face thereof parallel to said inlet duct opening, said endless belt having an upper

portion thereof facing said inlet duct outlet opening and having a lower portion thereof immersed in said liquid, electric motor means connected to at least one of said rollers whereby said motor means when actuated drives said rollers to rotatably transport said endless belt successively into immersion in said liquid and past said inlet duct outlet opening to impart moisture to the air stream exiting through said inlet duct outlet opening, blower means located downstream of said humidifying chamber for drawing ambient air through said air inlet duct and through said liquid-transport belt, an air discharge duct located downstream of said blower means, air temperature sensing means and humidity sensing means located in said



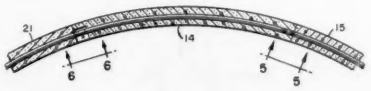
air discharge duct for detecting the temperature and humidity of air passing through said discharge duct, control means operative in response to said air temperature sensing means and humidity sensing means for actuating and de-actuating said electric air heater and said electric motor means driving said rollers to maintain the temperature and humidity of the air stream in said discharge duct respectively at preselected levels, a shutter pivotally mounted in said air inlet port for opening and closing said air inlet port, shutter control means on the front face of said housing and a cable linkage connecting said shutter to said shutter control means whereby actuation of said shutter control means is operative to selectively open and close said air inlet port.

3,869,530

METHOD OF CONSTRUCTING A PRESTRESSED CONCRETE CIRCULAR WALL

Chester I. Williams, 1501 Madison S.E., Grand Rapids, Mich. 49507

Filed Feb. 19, 1974, Ser. No. 443,828
Int. Cl. E04b *1/16;* **E04c** *5/07*
U.S. Cl. 264—33 **7 Claims**



1. A method of constructing a circular pre-stressed reinforced concrete wall, said method including placement of spaced form sections and pouring concrete between said spaced sections, wherein the improvement comprises:

placing spaced form sections including end panels to form a first sector of a circular wall;

placing a shielding tube around reinforcing rod means having threaded ends, and placing said tube and rod means peripherally in the space between said form sections, with said ends projecting from said end panels;

pouring concrete between said form sections including submerging said tube and rod means, and permitting said concrete to set;

exposing at least part of the ends of said set concrete, and applying bearing plates over said rod means ends, and nut means to said threaded ends;

applying tension to said rod means between said plates, and securing said nut means;

placing form sections to form an adjacent sector of said wall with an end of said set concrete of said first sector defining one end of the space between said form sections, the opposite end of said space being defined by an end panel; placing a shielding tube around reinforcing rod means having threaded ends, and placing said tube and rod means peripherally in the space between said form sections, and coupling one end of said rod means of said adjacent sector to said rod means of said first sector, the opposite end of said adjacent sector rod means projecting from said opposite end panel;

pouring concrete in said space between said form sections submerging said tube, rod means and coupling, and permitting said latter concrete to set to form said adjacent sector;

exposing at least part of the end of said set concrete of said adjacent sector defined by said opposite end panel and applying a bearing plate over the end of said rod means projecting from said opposite end and nut means to said latter threaded end;

applying tension to said latter rod means;

repeating the steps for constructing said adjacent sector to form successive adjacent sectors of said wall;

placing form sections to form a closure sector of said wall, the space between said form sections being defined by the ends of the set concrete of said first sector and the last of said adjacent sectors;

placing a shielding tube around reinforcing rod means having threaded, one of said threaded ends being of opposite hand to the threaded end of said rod means projecting from said first sector, placing said latter tube and rod means in said space between said form sections, coupling said latter rod means to the rod means projecting from said last adjacent sector, and applying a turnbuckle coupling connecting said rod means of said first sector and the rod means of said closure sector, and boxing out a space between said form sections surrounding said turnbuckle coupling, said space providing access from the exterior of said wall;

pouring concrete between said form sections, including submerging said tube and rod means and permitting said concrete to set to form said closure sector; and

tightening said turnbuckle coupling to apply tension to the rod means of said closure sector.

3,869,531

ADHESION OF URETHANE FOAMS TO PVC SKINS

Hartley A. Silverwood, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.

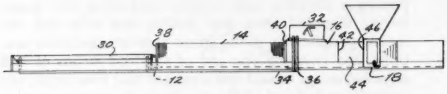
Filed Feb. 21, 1974, Ser. No. 444,478
Int. Cl. B29d *27/00*
U.S. Cl. 264—46.6 AP **2 Claims**

1. In the manufacture of an automobile trim component comprising a covering of a flexible plasticized polyvinylchloride resin filled with a urethane polyether foam foamed in situ by the prepolymer technique, the improvement for increasing the adhesion to said covering by said foam comprising adding to the reactants for said foam in the range of 0.5 to 2 weight percent of a polyol consisting of a 1000 to 4000 molecular weight polycaprolactone diethylene glycol adipate copolymer, as an adhesion improving additive.

3,869,532
METHOD OF MANUFACTURING FLOATING BOAT DOCK MODULES

Clarence Lee Shirrell, Cape Girardeau, Mo., assignor to Rosecon, Inc., Cape Girardeau, Mo.

Filed Jan. 11, 1974, Ser. No. 432,536
Int. Cl. B28b *1/08*; **B63b** *35/00*
U.S. Cl. 264—71 **12 Claims**



1. A method of producing a floating boat dock module comprising the steps of:

fastening at least one layer of wire mesh to a low density bouyant forming member so as to form an enclosure therefor;

placing said forming member with said wire mesh attached thereto, on a movable container member containing an adequate amount of concrete to form a bottom portion of a concrete covering for said member and said mesh;

feeding said container member carrying said forming member and said mesh, into an aligning portion of a coating apparatus so as to align said forming member and mesh in appropriate relation to a coating portion of said coating apparatus;

feeding said container member carrying said forming member and mesh, into said coating portion;

coating a top and side portions of said forming member and mesh with an adequate amount of concrete to form the top and side portions of a concrete covering therefor;

feeding said container member, forming member and mesh into a sizing portion of said coating apparatus whereby the dimensions of said top, bottom and side portions are established;

removing said forming member and mesh from said sizing portion and said container member; and

coating end portions of said forming member and mesh with adequate concrete to form the end portions of a covering therefor and thus complete the enclosure of said forming member and mesh to form said floating boat dock module.

3,869,533
PROCESS FOR THE MANUFACTURE OF MONOAXIALLY STRETCHED FILM STRIPS

Siegfried Janocha; Walter Seifried, and Horst Gebler, all of Wiesbaden-Biebrich, Germany, assignors to Kalle Aktiengesellschaft Wiesbaden, Biebrich, Germany

Filed July 10, 1969, Ser. No. 840,857
Claims priority, application Germany, July 12, 1968, 1779150
Int. Cl. B29d *7/24*
U.S. Cl. 264—146 **6 Claims**

1. A process for the manufacture of monoaxially stretched film strips from a film of a high-polymer thermoplastic synthetic material which comprises extruding a melt of the high-polymer material from a flat die to form a film, longitudinally stretching the film heated to an effective stretching temperature in a narrow gap in the range of a few millimeters to the film thickness, cutting the film longitudinally into strips, and longitudinally stretching the strips heated to an effective stretching temperature in a wide gap in the range of the initial width of the film to several meters.

3,869,534
METHOD FOR MANUFACTURING STRETCHED POLYVINYLIDENE FLUORIDE FILMS

Shinsuke Yoshikawa; Tohru Sasaki; Mitsuru Ota; Shuji Terasaki, and Akira Funakoshi, all of Fukushima, Japan, assignors to Kureka Kagaku Kogyo K.K., Tokyo, Japan

Filed Apr. 6, 1973, Ser. No. 348,819
Claims priority, application Japan, Apr. 6, 1972, 47-34699
Int. Cl. B29d *7/24*
U.S. Cl. 264—210 R **7 Claims**

2. A method for manufacturing a biaxially oriented polyvinylidene fluoride film which comprises forming a non-stretched polyvinylidene fluoride film from melt-extruding a polyvinylidene fluoride polymer having an inherent viscosity in the range of from 0.8 to 1.8 as determined in a dimethylformamide solution at a concentration of 0.4 g/100 cc at a temperature of 30°C, cooling and solidifying the extruded film at a temperature of from 80° to 150°C to form a non-stretched film containing spherulites having a diameter of from 2 to 20 μ, stretching the resulting film in the longitudinal direction at a temperature of from 140° to 165°C to a stretch magnification ranging from the spontaneous stretch magnification of said film to 1.8 times said spontaneous stretch magnification, and subsequently stretching the resulting uniaxially stretched film in the cross direction at a temperature of from 150° to 175°C by 4.0–8.0 times followed by thermally fixing the biaxially stretched film.

3,869,535
EMBOSSING ROLLERS AND METHOD OF EMBOSSING

Miguel Coll-Palagos, Rye, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 858,136, Sept. 15, 1969, abandoned. This application Aug. 4, 1972, Ser. No. 277,959
Int. Cl. B29c *1/02*; **B28b** *11/08*; **C23b** *5/56*
U.S. Cl. 264—219 **7 Claims**

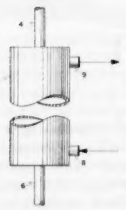
1. A method which comprises embossing a substrate with an engraved embossing master surface which has been subjected to the following succession of steps:

1. electropolishing said master surface;
2. electroplating the polished master surface with a brightening metal having a high to medium levelling effect and subsequently
3. electroplating with a metal having a relatively lower levelling effect.

3,869,536
DISPLACEMENT CHROMATOGRAPHIC METHOD FOR SEPARATING URANIUM ISOTOPES

Dean B. James, Franklin Township, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Nov. 12, 1970, Ser. No. 88,904
Int. Cl. C01g *43/02*
U.S. Cl. 423—7 **6 Claims**



1. A method for separating U^{235} isotope from U^{238} isotope comprising

first, feeding a solution containing trivalent titanium to a column system containing cation-exchange resin;

second, feeding a solution containing hexavalent uranium and recovering a solution containing tetravalent titanium;

third, feeding a solution containing trivalent iron and recovering a solution containing hexavalent uranium enriched in U^{235} isotope;

fourth, recovering a solution containing hexavalent uranium of the same isotopic composition as the feed, and

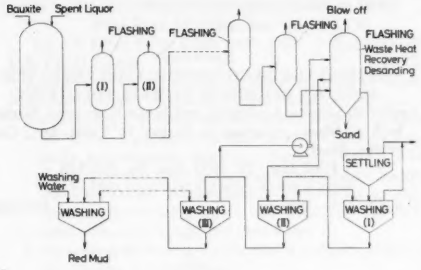
provided, however, that the feeding of said solution containing trivalent iron is initiated before the trivalent titanium, sorbed on the resin, is completely replaced by uranium.

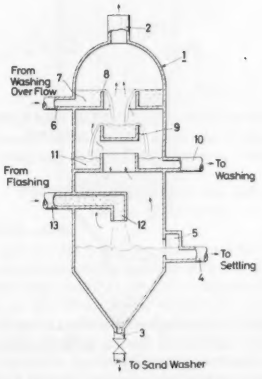
3,869,537

METHOD AND DEVICE FOR WASTE HEAT RECOVERY AND SAND REMOVAL IN THE BAYER PROCESS

Chosei Sato; Yasutoku Yamada, and Yoshiyuki Takenaka, all of Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1972, Ser. No. 228,624
Claims priority, application Japan, Feb. 4, 1971, 46-8667
Int. Cl. C01f *7/06*
U.S. Cl. 423—121 **3 Claims**





1. In the Bayer process for production of alumina by treating bauxite containing monohydrated alumina with an aqueous solution of caustic soda at high temperature and high pressure to form a slurry containing sand, said slurry being subjected to multistage flashing for lowering both temperature and pressure and generating steam, said slurry passing after said flashing through a series of continuous red mud thickeners in counterflow contact with wash water, and recovering alumina and caustic soda contained in said slurry from the overflow liquid from the red mud thickeners, the improvement which comprises the steps of introducing overflow liquid from the red mud thickener into a vessel, last stage flashing said slurry in said vessel, bringing said overflow liquid into counterflow contact with the steam generated by said last-stage flashing of slurry within said vessel and effecting heat exchange from the steam to the overflow liquid, forwarding heated overflow liquid back to the thickener and using it as wash water for red mud, discharging slurry from the vessel after flashing at a rate permitting settling of sand particles in a lower section of sand vessel, separately removing sand and slurry out of said vessel.

3,869,538

PROCESS FOR PRODUCING SODIUM CARBONATE FROM TRONA

Jared Sanford Sproul, Fanwood, and Eric Rau, Trenton, both of N.J., assignors to Intermountain Research and Development, Green River, Wyo.

Filed Jan. 10, 1973, Ser. No. 322,294
Int. Cl. C01d *7/12*
U.S. Cl. 423—206 **8 Claims**

1. In a process for preparing crude sodium carbonate from crude trona by calcining crushed crude trona, the improvement which comprises the following steps:

a. feeding crushed crude trona, ranging in particle size distribution from about 100% −⅜ inch mesh with a maximum of 10% −270 mesh, to about 100% −8 mesh with a maximum of 20% −400 mesh, into a fluid-bed calciner wherein a fluidized bed of crushed trona is formed by the action of gases introduced to the bottom of the bed at a controlled rate and from which bed gases are effluent;

b. heating the crushed trona in the fluidized bed at a temperature in the range of 125°–225°C until a crude sodium carbonate of substantially uniform soluble organic content is obtained;

c. separating a fine fraction of crushed trona from the fluidized bed by entrainment in the gases effluent from the fluidized bed,

d. further heating the separated fine fraction of crushed trona in a range of 125°–225°C until a crude sodium carbonate of substantially uniform soluble organic content is obtained; and

e. recovering the calcined product of steps b) and d).

3,869,539

PREPARATIONS CONTAINING FAT-SOLUBLE VITAMINS IN DRY, PARTICULATE, FREE-FLOWING FORM DISPERSIBLE IN COLD WATER AND METHOD OF PRODUCING SUCH PREPARATIONS

Peder Lund Kring, Virum, and Jorgen Lund, Herlev, both of Denmark, assignors to A/S Ferrosan, Copenhagen, Denmark

Continuation of Ser. No. 73,191, Sept. 17, 1970, abandoned, which is a continuation of Ser. No. 684,501, Nov. 20, 1967, abandoned. This application Feb. 26, 1973, Ser. No. 335,525
Claims priority, application Denmark, Dec. 1, 1966, 6230/66
Int. Cl. A61k *27/00*
U.S. Cl. 424—236 **3 Claims**

1. In a process for producing cold water dispersible preparations containing vitamins A, D or E, which comprises mixing the vitamin with a gelatine product and plasticizer, finely dividing the resultant mixture, solidifying the finely divided product and drying the solidified product, the improvement wherein the gelatine product is prepared by partially decomposing gelatine by treating the gelatine for 0.15–1 hour at 40°–95° C with 0.1–0.3 gram equivalent of sodium hydroxide per 100 grams of gelatine and neutralizing the partially decomposed gelatine to a pH of 4.5–7.0 with hydrochloric acid or sulfuric acid, and the vitamin is mixed with 10–60% by weight of gelatine product, based on the weight of the dispersible preparation.

3,869,540

MONTMORILLONITE CLAY CATALYSTS FOR THE PRODUCTION OF PHOSPHONITRILIC CHLORIDE

Donald Hardy, Sr., Yardley, Pa., assignor to FMC Corporation, New York, N.Y.

Filed May 25, 1973, Ser. No. 364,057
Int. Cl. C01b *25/10*
U.S. Cl. 423—300 4 Claims

1. A process for the production of phosphonitrilic chlorides which consists essentially of heating phosphorus pentachloride with ammonium chloride having a particle size greater than 200 mesh in an inert solvent at a temperature greater than 100° C and in the presence of at least 1 gram of acid-treated Montmorillonite clay for each gram-mole of PCl_5 charged to the reaction mixture.

3,869,541

METHOD FOR MANUFACTURING HYDRAZINE

Francis Weiss, Pierre-Benite; Jean-Pierre Schirmann, Brignais, and Henri Mathais, Sainte-Foy-les Lyon, all of France, assignors to Produits Chimiques Ugine Kuhlman, Paris, France

Filed Jan. 3, 1972, Ser. No. 215,173
Claims priority, application France, Jan. 7, 1971, 71.00299
Int. Cl. C01b *21/16*
U.S. Cl. 423—407 41 Claims

1. A method for the manufacture of hydrazine hydrate which comprises:

a. reacting

i. a ketone of the formula

$$R_1—CO—R_2 \quad (I)$$

wherein the radicals R_1 and R_2 each is a straight or branched chain alkyl radical or cycloalkyl radical containing up to about 10 carbon atoms, an unsubstituted phenyl radical or a phenyl radical substituted with one or more radicals which are stable in the reaction medium or R_1 and R_2 together is a straight or branched chain alkylene radical containing from 3 to about 11 carbon atoms with

ii. ammonia (NH_3),

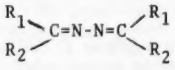
iii. hydrogen peroxide (H_2O_2), and

iv. a nitrile of the formula

$$R_3 — CN \quad (II)$$

wherein the radical R_3 is an acyclic or cyclic radical containing less than 8 carbon atoms, an unsubstituted phenyl radical or a phenyl radical substituted with one or more radicals which are stable in the reaction medium to produce

v. a ketazine of the formula



(III)

and

vi. a carboxylic amide of the formula:

$$R_3—CO—NH_2 \quad (IV)$$

b. separating the ketazine (III) from the reaction medium; and

c. reacting the ketazine (III) with water, or both to produce hydrazine hydrate and regenerate the starting ketone (I).

3,869,542

METHOD FOR PRODUCING POTASSIUM AZIDE

William K. Snead, Wheeling, and Robert E. McGreevy, New Martinsville, both of W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 810,980, March 27, 1969, Pat. No. 3,803,296. This application Aug. 5, 1970, Ser. No. 61,275
Int. Cl. C01b *21/08*
U.S. Cl. 423—410 27 Claims

1. A method for producing potassium azide comprising:

a. removing water at a first temperature from an aqueous solution containing at least 2 per cent by weight of the total anhydrous salts present therein, each of the following salts: sodium azide and tripotassium orthophosphate to precipitate potassium azide and to form a first mother liquor;

b. separating said precipitated potassium azide from the bulk of said first mother liquor;

c. decreasing the temperature of said separated first mother liquor to a temperature which is lower than said first temperature to precipitate a sodium phosphate and form a second mother liquor; and

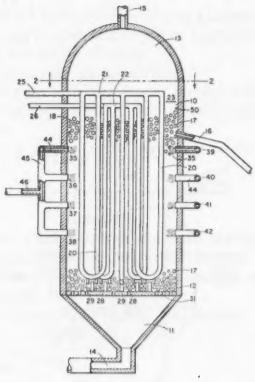
d. separating said precipitated sodium phosphate from the bulk of said second mother liquor.

3,869,543

METHOD FOR DECOMPOSING CONCENTRATED AQUEOUS ALUMINUM NITRATE SOLUTIONS

August H. Schutte, Lexington, and James T. Stevens, Bedford, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 18, 1971, Ser. No. 125,758
Int. Cl. C01b *21/42*; C01f *7/30*; B01j *1/00*
U.S. Cl. 423—390 10 Claims



1. A method of decomposing a concentrated aqueous aluminum nitrate solution to form a solid alumina product and nitric acid comprising the steps of

a. providing at least two separate beds of fluidizable particles each of said beds having a plurality of vertically oriented spaced tubing sections extending therethrough;

b. continuously circulating a heat transfer fluid through said tubing sections of each of said beds whereby said bed particles are heated by said heat transfer fluid by indirect heat exchange through the walls of said tubing sections;

c. introducing an aqueous solution of aluminum nitrate beneath the surface of each of said beds in a manner to prevent any appreciable amount of said liquid aluminum nitrate from impinging directly onto the surfaces of said tubing sections;

d. fluidizing said bed particles of one of said beds with steam;
e. using the off-gas effluent from said one bed fluidized with steam as the fluidizing gas for the remaining of said beds;
f. maintaining the temperature of said heat transfer fluid within a temperature range such that said liquid aluminum nitrate solution is substantially instantaneously heated to a temperature between about 150° and 300°C as it contacts the surface of said bed particles;
g. removing the solid product from each of said fluidized beds; and
h. withdrawing the effluent off-gases containing nitric acid from said remaining of said fluidized beds.

3,869,544

STABILIZATION OF ALUMINUM HYDRIDE

Earl Thomas Niles, Midland; Beverly A. H. Seaman, Midland County, and Edwin J. Wilson, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 24, 1968, Ser. No. 740,830
Int. Cl. C01b 6/34; C01b 6/00; C01f 1/00, 3/00, 7/00
U.S. Cl. 423—645 **10 Claims**

1. A process for increasing the thermostability of a substantially non-solvated aluminum hydride which comprises;
a. contacting at a temperature of from about 25° C. to about 80° C. for a period of at least about 24 hours a substantially non-solvated aluminum hydride with a treating liquid selected from the group consisting of hydrazine, alkylhydrazines, alkylamines, hydrocarbons or alcohols wherein the treating liquid has associated therewith at least about 0.1 weight per cent water,
b. separating the so-treated aluminum hydride product from the treating liquid, and
c. drying said aluminum hydride product.

3,869,545

PREPARATION OF ALUMINUM HYDRIDE

Kazuji Terada, Midland, and Buddy L. York, Akron, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 3, 1964, Ser. No. 349,795
Int. Cl. C01b 6/00
U.S. Cl. 423—645 **4 Claims**

1. In a process for preparing aluminum hydride by reacting an alkali metal aluminum hydride with aluminum chloride in an aliphatic ether solution the improvement which comprises: providing as the alkali metal aluminum hydride reactant a mixture of sodium aluminum hydride and lithium aluminum hydride in an aliphatic ether, the molar proportions of said sodium aluminum hydride-lithium aluminum hydride being about 5/1 to about 1/1, adding to said mixture over a period of from about 5 seconds to about 40 minutes while maintaining the reaction temperature below the boiling point of the ether aluminum chloride in an amount at a maximum of about 10 weight percent in excess of that required for stoichiometric reaction with said sodium aluminum hydride thereby to prepare aluminum hydride and co-precipitated inorganic halides and other impurities, dissolving said aluminum hydride in aliphatic ether solvent thereby freeing said aluminum hydride product from said co-precipitated inorganic halides and other impurities, and removing the co-precipitated solids from said aluminum hydride product solution.

3,869,546

ADJUVANT COMPOSITIONS AND MEDICINAL MIXTURES COMPRISING THEM

Lloyd J. Lund, Moraga, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Dec. 22, 1972, Ser. No. 317,752
Int. Cl. A61k 27/00
U.S. Cl. 424—88 **6 Claims**

1. A biologic solution comprising an antigen which stimulates the production of antibodies and an adjuvant therefore consisting essentially of a colloidally water-soluble neutralized polymer of acrylic acid cross-linked with from 0.75 to 2.000 percent of polyallylsucrose or polyallylpentaerythritol, wherein the polymer is present at a concentration of at least about 0.2 percent and the biologic solution comprises a physiologically acceptable electrolyte at a concentration which is effective to lower substantially the viscosity imparted to the solution by the polymer to a maximum of 2,000 cps.

3,869,547

CALF DIARRHEA VIRUS VACCINE AND PROCESSES

Charles A. Mebus, and Marvin J. Twiehaus, both of Lincoln, Nebr., assignors to Board of Regents of the University of Nebraska, Lincoln, Nebr.

Continuation-in-part of Ser. No. 197,520, Nov. 10, 1971, , which is a continuation-in-part of Ser. No. 90,481, Nov. 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 880,956, Nov. 28, 1969, abandoned. This application Nov. 7, 1973, Ser. No. 413,734
Int. Cl. C12k 7/00; A61k 23/00
U.S. Cl. 424—89 **10 Claims**

1. An attenuated reovirus-like calf-diarrhea vaccine comprising (1) a reovirus-like calf-diarrhea virus which has been attenuated by passaging a virulent reovirus-like calf-diarrhea virus, identified by immunofluorescence, in tissue culture which supports growth of the virus, continuing until a noticeable cytopathological effect is observed, said cytopathological effect being apparent from flagging produced or infection followed by immunofluorescence, from about 37 to 250 times until the attenuated virus, while inducing immunity in neonatal calves, does not produce disease, and (2) a carrier, the titer of said attenuated virus being at least 10^2 TCID/ml.

3,869,548

MEDICAMENT FOR THE TREATMENT OF DISORDERS OF THE EYE

Georges Dabis, Bordeaux, France, assignor to Societe d'Etudes Et D'Exploitation de Marques et Brevets-S.E.M.S., Asnieres, France

Filed Jan. 22, 1968, Ser. No. 699,293
Claims priority, application France, Jan. 26, 1967, 67.92655
Int. Cl. A61k 17/18, 19/00
U.S. Cl. 424—94 **3 Claims**

1. A method of treating the human eye disorders of diabetic retinopathy and degenerative maculation of the eye, comprising the step of administering by means of injection to the human a composition containing heparin and a detoxified enzyme obtained from venom of a Brazilian viper selected from the group consisting of Bothrops Jararaca and Lachesis Atrox in a dosage of 2000 to 2500 International Units of heparin in accordance with the French Pharmacopoeia and 1 to 2 coagulation units of the enzyme until the disorder is ameliorated, the detoxified enzyme being obtained by desiccating the venom to form a venom powder, dissolving the venom powder in distilled water to form a solution, adding ammonium sulfate crystals to said solution to precipitate an enzymatically active first fraction, recovering said enzymatically active first fraction from the solution by filtration, precipitating from the filtrate by addition of magnesium sulfate thereto to form an enzymatically toxic second fraction, purifying the fractions by dialysis, detoxifying the second fraction by exposing it to the light of a quartz lamp, mixing the fractions

to obtain an enzymatically active product of constant and definitive activity, and mixing said product with heparin.

3,869,549

INJECTABLE OILY PEPTIDE PREPARATIONS AND PROCESSES FOR THEIR MANUFACTURE

Leo Geller, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,519

Claims priority, application Switzerland, Feb. 17, 1972, 2299/72; Dec. 7, 1972, 17829/72

Int. Cl. C07c *103/52*

U.S. Cl. 424—177 **17 Claims**

1. Process for the manufacture of injectable oily ACTH-active peptide preparations which contain an effective dose of an ACTH-active peptide or of its therapeutically usable salts, characterized in that said peptide or peptide salt, as an adsorbate on an aluminum salt of a saturated or unsaturated fatty acid, having 12–22 carbon atoms is suspended in oil, or said peptide or peptide salt is suspended in an oily gel which contains an aluminum salt of a saturated or unsaturated fatty acid having 12–22 carbon atoms as the gel-forming agent.

3,869,550

METHOD FOR THE CONTROL OF FERTILITY

Dan W. Dalgard, Springfield, Va., and Donald E. Coval, Sheridan, Ind., assignors to Environmental Science Corporation, Vienna, Va.

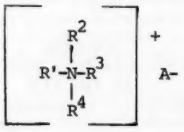
Continuation-in-part of Ser. No. 249,230, May 1, 1972, abandoned. This application Apr. 11, 1973, Ser. No. 349,285

Int. Cl. A61k *27/00*

U.S. Cl. 424—227 **13 Claims**

1. A method for the control of fertility in a female mammal comprising administering to the female mammal at the time of mating or within an effective period thereafter an anti-fertility effective amount of a compound selected from the group consisting of

a. a quaternary ammonium compound of the formula



wherein R′ is selected from the group consisting of alkyl having a maximum of 22 carbon atoms, phenyl, benzyl, R^5O— and HOR^6O—, wherein R^5 is alkyl having a maximum of 5 carbon atoms and R^6 is alkylene having a maximum of 5 carbon atoms; R^2, R^3 and R^4 are each independently alkyl having a maximum of 20 carbon atoms; and A is a pharmaceutically acceptable anion; and

b. mixtures of more than one such quaternary ammonium compound.

3,869,551

CERTAIN CARBONATES USEFUL FOR CONTROLLING MOLLUSKS AND AQUATIC ORGANISMS

Jacques Mocotte, St. Didier au Mont d'Or, and Monique Druet, Lyon, both of France, assignors to Progil, Paris, France

Continuation of Ser. No. 53,992, July 10, 1970, abandoned. This application Jan. 3, 1973, Ser. No. 320,742

Claims priority, application France, July 25, 1969, 69.25380

Int. Cl. A01n *9/24*

U.S. Cl. 424—301 **24 Claims**

1. A method of controlling mollusks and aquatic organisms selected from the group consisting of crustacea, hydra, bryozoa and ascidia which comprises:

applying to said mollusks and aquatic organisms in water, an effective amount to kill said mollusks and aquatic organisms of methyl-(2-methyl-4,6-dinitrophenyl) carbonate.

3,869,552

CHRYSANTHEMIC ACID ESTERS AND THEIR USE AS INSECTICIDES

John Mervyn Osbond, Hatfield, and James Charles Wickens, Saint Albans, both of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

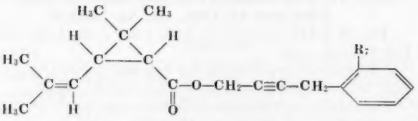
Division of Ser. No. 880,964, Nov. 28, 1969, Pat. No. 3,663,591. This application Feb. 11, 1972, Ser. No. 225,597

Claims priority, application Great Britain, Dec. 9, 1968, 58351/68; Dec. 9, 1968, 58352/68; Dec. 9, 1968, 58353/68; Dec. 9, 1968, 58354/68

Int. Cl. A01n *9/24*

U.S. Cl. 424—306 **3 Claims**

1. An insecticidal composition comprising as an active ingredient thereof an insecticidally effective amount of a chrysanthemic acid ester of the formula:



wherein R_7 is hydrogen or lower alkyl; and a carrier.

3,869,553

SUBSTITUTED BENZOIC ACID HYPOLIPEMIC AGENTS

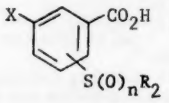
Gerald Fagan Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 304,528, Nov. 7, 1972, , which is a division of Ser. No. 155,209, June 21, 1971,. This application May 3, 1974, Ser. No. 466,775

Int. Cl. A61k *27/00*

U.S. Cl. 424—317 **8 Claims**

1. A method for reducing blood lipid levels which comprises administering to a hyperlipemic mammal a hypolipemic amount of a compound selected from the group consisting of



and the phramaceutically acceptable salts thereof wherein

X is selected from the group consisting of fluorine, chlorine, bromine, methyl, methoxy and trifluoromethyl;

R_2 is selected from the group consisting of methyl, 2-hydroxyethyl, allyl, methallyl, crotyl and acylmethyl of the formula

wherein R is selected from the group consisting of alkyl containing from 1 to 4 carbon atoms and phenyl and substituted phenyl wherein said substituent is selected from the group consisting of fluorine, chlorine, methyl, trifluoromethyl and methoxy and

n is an integer from 0 to 2.

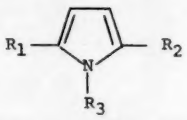
3,869,554

PROCESS FOR ALTERING THE FLAVORING PROPERTIES OF FOODSTUFFS

Alan O. Pittet, Atlantic Highlands; John V. Pascale, Jackson, and Denis E. Hruza, Bricktown, all of N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Apr. 21, 1972, Ser. No. 246,484
Int. Cl. A23l *1/26*
U.S. Cl. 426—65 5 Claims

1. A process for altering the flavoring properties of a foodstuff which comprises adding thereto a small but effective amount of at least one N-substituted pyrrole having the formula



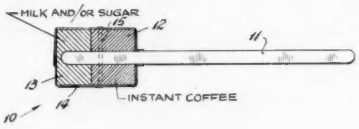
wherein R_1 and R_2 are the same or different and represent hydrogen or methyl and R_3 is a cycloalkyl group containing three to 12 carbon atoms.

3,869,555

INSTANT BEVERAGE ARTICLE

Angelo Alexander Heonis, 460 Catherine St., Bridgeport, Conn. 06604

Filed Mar. 6, 1973, Ser. No. 338,512
Int. Cl. A23l *1/00*
U.S. Cl. 426—134 8 Claims



1. An instant beverage article suitable for the preparation of a liquid beverage upon addition to a liquid, comprising a stick having bonded adjacent one end thereof a quickly dissolvable solid base mass comprising a water-soluble particulate base material selected from the group consisting of coffee, tea, cocoa, eggnog and chocolate and a minor amount by weight of a water-soluble, digestible binder material and having bonded to said stick adjacent said base mass at least one solid flavoring mass comprising a water-soluble flavoring material selected from the group consisting of sweetening agents and milk and mixtures thereof and a water-soluble, digestible binder material, said flavoring mass being manually removable from said stick by taking said mass between the fingers and removing it as a solid mass by the application of slight pressure while said base mass is retained on said stick, if desired, to provide an article suitable for the preparation of base beverage free of the flavoring material, and said stick functioning as a stirrer to assist the dissolving of said base mass in said liquid.

3,869,556

PROCESS FOR PREPARING QUICK-COOKING GARBANZO AND RED KIDNEY BEANS

Louis B. Rockland, Moraga; Eufrocina M. Zaragosa, and Dulcie M. Hahn, both of Albany, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 27, 1973, Ser. No. 401,324
Int. Cl. A23l *1/20*
U.S. Cl. 426—352 6 Claims

1. A process for treating garbanzo beans to make them quick-cooking while retaining the integrity of the beans and the seed coats thereof, which consists of

soaking raw garbanzo beans for about 24 hours at ambient temperature and atmospheric pressure in an aqueous hydrating medium consisting solely of water, 2% sodium chloride, 0.375% sodium bicarbonate, and 0.125% sodium carbonate.

3,869,557

METHOD FOR PRESERVING FRUIT PULPS HAVING A HIGH CONTENTS OF IRON SALTS AND PULPS THUS PRESERVED

Bruno Vrespa, via Pisacane 16, Milan, Italy

Filed Mar. 14, 1974, Ser. No. 451,151
Int. Cl. A23b *7/00*
U.S. Cl. 426—393 9 Claims

1. A method for preserving fruit pulps having a high iron salt content, comprising the steps of pressing a fruit pulp in a mold to form a cake, packaging the cake in a container made of a gas-impervious material, deep-freezing the container at a temperature in the range from about −40°C. to about −50°C. and finally sealing said container, all operations, from pulp pressing to sealing of the container, being performed in an atmosphere substantially free from oxygen so that the iron salts are not oxidized.

3,869,558

PROCESS FOR MAKING A FREE FLOWING FLOUR

Richard John Hampton, Pierrefonds; John T. Shantz, Valois, Quebec; Thomas Gallo, Toronto, Ontario, and Peter Unger, St. Lambert, Quebec, all of Canada, assignors to The Ogilvie Flour Mills Company, Limited, Montreal, Quebec, Canada

Filed Oct. 26, 1970, Ser. No. 83,803
Int. Cl. A21d *6/00*
U.S. Cl. 426—443 7 Claims

1. Process for making a free-flowing dry cereal flour with a non-gelatinized or non-hydrolyzed starch fraction, a denatured protein fraction and substantially no active α-amylase and lipid-degrading enzymes, said flour being characterized by a moisture content of between about 4 and about 10 per cent by weight and an ability to yield a cooked aqueous slurry with a Hagberg falling number of at least 270 seconds which comprises indirectly heating a natural cereal flour with a conventional native moisture content of about 8 to about 15 per cent by weight within an enclosed vessel to a temperature of about 120° to about 160°C., holding the temperature within this range for about 5 to about 60 minutes, whereupon the moisture vaporizes to provide an atmosphere of water vapor around the flour while agitating said flour so as to substantially preclude the formation of agglomerates, and removing said flour from said vessel thereby reducing its conventional native moisture content to the desired level of between about 4 and about 10 percent.

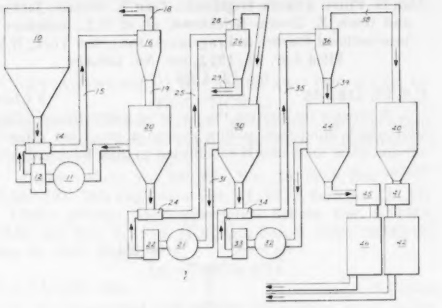
3,869,559

PROCESS FOR SEPARATION AND CLEANING OF EDIBLE VEGETABLE PRODUCTS

Thomas P. Clark, 6127 Flower St., Arvada, Colo. 80002

Filed Apr. 13, 1970, Ser. No. 27,907
Int. Cl. A23l *1/00*
U.S. Cl. 426—481 4 Claims

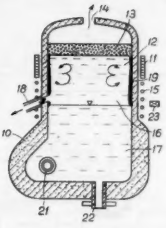
1. A process for the continuous separation of edible vegetable products from both heavier and lighter foreign substances, comprising the steps of continuously dynamically mixing and suspending vegetable products to be cleaned and separated with a first separation solution having a specific gravity such that the vegetable product and heavier substances tend to sink and lighter substances tend to float in said solution, separating said suspended vegetable product and heavier substances from said lighter substances in a hydrocyclone separator, separating said vegetable product and heavier substance from said separation solution, dynamically mixing and suspending said vegetable product and heavier substances with a second separation solution having a specific gravity such that the vegetable product tends to float and the heavier than vegetable product substances tend to sink, separating said suspended vegetable product from said heavier substances in a hydrocyclone separator, and separating said vegetable product from said second separation solution.



3,869,560
INDUCTION FURNACE FOR MELT REDUCTION

Bertil Henrik Hanas, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 6, 1973, Ser. No. 394,774
Claims priority, application Sweden, Sept. 7, 1972, 11527/72
Int. Cl. H05b *5/16*
U.S. Cl. 13—29 **5 Claims**

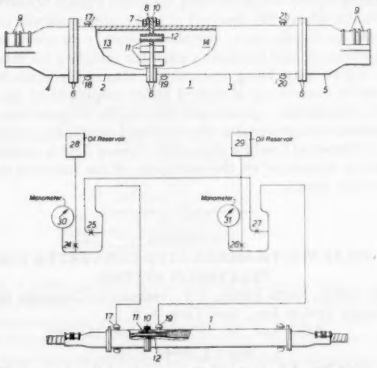


1. An induction furnace for the melt reduction of metal oxides and comprising a vessel for containing a melt of reduced metal with slag floating thereon and reducing material floating on the slag and to which metal oxides are fed for reduction, and having a first means for inductively heating said reduced metal, means for cooling said vessel adjacent to the level where said slag floats on said reduced metal, and a second means for inductively heating said slag adjacent to the level where said material floats on said slag.

3,869,561
CABLE SEPARATING JOINT

Gunnar Wettre, Asker, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 27, 1973, Ser. No. 392,158
Claims priority, application Norway, Oct. 2, 1972, 3511/72
Int. Cl. H02g *15/24*
U.S. Cl. 174—11 R **12 Claims**

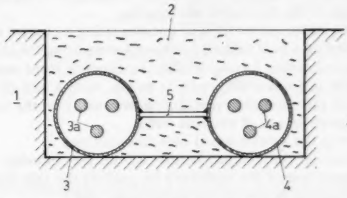


1. A separating joint for an oil filled electrical cable comprising a plurality of insulated conductors, first and second adjacent cable enclosures around said conductors, said enclosures having adjacent facing end flanges, and a common separating flange secured to and between said facing end flanges of said enclosures, said common separating flange providing two hydraulic chambers for oil on respective opposite sides thereof separated only by said common separating flange, said separating flange having a plurality of openings passing said insulated conductors between said two hydraulic chambers, said insulated conductors fitting sufficiently closely in said openings to allow only a small flow of oil from one side of the separating flange to the other upon occurrence of a pressure difference between the two sides.

3,869,562
DUAL UNDERGROUND CABLE SYSTEM FOR TRANSMITTING ELECTRICAL POWER

Adolf Eidinger, Nussbaumen, and Carl-Dieter Floessel, Fislisbach, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 5, 1974, Ser. No. 439,745
Claims priority, application Switzerland, Mar. 26, 1973, 4252/73
Int. Cl. H01b *7/34, 9/06*
U.S. Cl. 174—15 C **5 Claims**

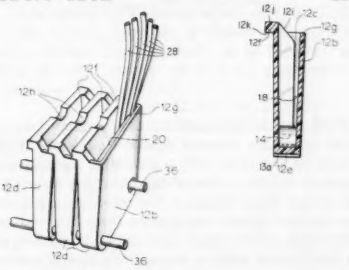


1. A dual system for transmission of electrical power underground and which provides for dissipation of heat from each such system into the surrounding earth comprising two three-phase compressed-gas-insulated transmission lines extending in parallel spaced relation in the earth and which operate electrically in parallel, each said transmission line comprising three conductors encapsulated within at least one metallic tube filled with a compressed insulating gas and from which heat is dissipated into the earth, and metallic heat conductive members interconnecting said parallel spaced conductor encapsulating tubes and which extend longitudinally in a substantially continuous manner throughout the entire length of said dual power transmission lines whereby in case of a failure of one of said transmission lines the normal load carried by the other can be substantially increased due to the additional heat dissipating capacity provided by the encapsulating tube of the failed line.

3,869,563
ENCAPSULATION HOUSING FOR ELECTRONIC CIRCUIT BOARDS OR THE LIKE AND METHOD OF ENCAPSULATING

Alfred Ocken, Jr., Franklin Park, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 27, 1973, Ser. No. 401,471
Int. Cl. H05k *5/06;* **B29c** *6/02*
U.S. Cl. 174—52 PE **20 Claims**



1. An improved protective enclosure for encapsulating an electrical control circuit arranged on a circuit board, comprising

a housing structure formed with a base, vertically upstanding side walls and front and back end walls, open at the

top, with a pair of guide rails, each rail extending verticaly on the interior of a respective one of said side walls, said guide rails defining a pair of congruent channels in said side walls extending contiguous to one of the end walls for guiding the control circuit board to a position flatly against the one end wall upon inserting the control board into the housing;

said housing further including a ledge extending laterally and outwardly from the top of one end wall, said ledge having a bottom edge, said other end wall having a top edge, the height of the bottom edge of said ledge above said base in relation to the height of the top edge of the other end wall above said base being dimensioned such that said housing is adaptable for stacking in multiple units in a vertical, side-by-side relation whereby said laterally extending ledge of one housing overlies the top edge of the next adjacent housing.

16. An improved method of encapsulating a control device assembled on a heat sink circuit board comprising the steps of: forming a housing having a base, upstanding front and rear end walls and side walls, open at its top, with a pair of guide rails each rail extending vertically downwardly on the interior of a respective one of the side walls;

inserting the circuit board into the housing;

positioning the circuit board within the housing flatly against one of the end walls by guiding the side edges of the circuit board on the guide rails; and

pouring encapsulating material into the housing in an amount sufficient to cover the control device assembled on the circuit board.

3,869,564

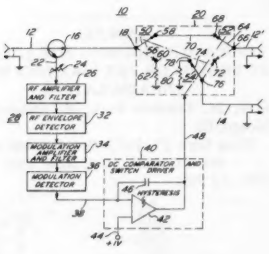
TRUNK SWITCHING SYSTEM

Samuel H. Colodny, Levittown, Pa., assignor to American Electronic Laboratories, Inc., Colmar, Pa.

Filed Aug. 30, 1973, Ser. No. 392,998

Int. Cl. H04n *7/18;* **H04h** *1/02*

U.S. Cl. 178—6 **10 Claims**



1. A trunk switching system for concurrently receiving a plurality of television channel signals from more than one remote location and selectively transmitting signals from one of said remote locations comprising switching means having first and second input terminals for receiving a plurality of television channel signals respectively from first and second remote locations and an output terminal, said switching means having a first normal position transmitting signals received at its first terminal to its output terminal and a second position transmitting signals received at its second terminal to its output terminal, and detecting means receiving the signals received by said first input terminal of said switching means from said first remote location and activating said switching means to its second position upon its failure to receive television channel signals from said first remote location.

3,869,565

PICTURE GENERATING UNIT OF SCANNING TYPE

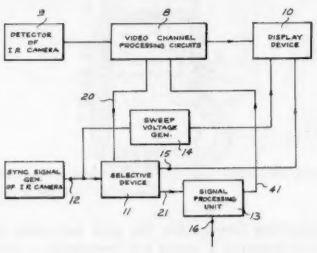
Tore Bertil Reinhold Olsson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Mar. 17, 1971, Ser. No. 125,126

Claims priority, application Sweden, Mar. 26, 1970, 4273/70. The portion of the term of this patent subsequent to Mar. 4, 1991, has been disclaimed.

Int. Cl. H04n *5/19*

U.S. Cl. 178—6.8 **10 Claims**



1. In combination with a scanning camera which generates scanning signals for controlling the scanning of a viewing field and generates amplitude modulated information signals related to the amplitude of the radiation at points within the viewing field, a video channel which receives the information signals and includes threshold establishing means for establishing a threshold level of signals transmitted therefrom, and a scanning display means for visually displaying the information signals transmitted from the video channel and being synchronized to said scanning camera by said scanning signals, apparatus for automatically controlling said establishing means to establish a threshold level related to the amplitude of the radiation at a particular area of the viewing field of the scanning camera comprising selective means receiving said scanning signals for generating selection signals occurring at particular times after the start of said scanning signals related to said particular area, sampling means responsive to the occurrence of said selection signals for sampling the information signals then being transmitted, means for generating a threshold control signal related to the amplitude of the sampled information signals and means for transmitting the threshold control signal to the threshold establishing means so that a threshold level for the entire viewing field is established which is dependent on the amplitude of the radiation in said particular area.

3,869,566

PULSE-WIDTH-MODULATED CONVERTER FOR TELEVISION SYSTEM

Clyde Smith, North Salem, N.Y., assignor to Columbia Broadcasting System Inc., New York, N.Y.

Filed Apr. 20, 1973, Ser. No. 353,091

Int. Cl. H04n *5/38*

U.S. Cl. 178—7.2 **9 Claims**

1. In a television system which includes a source of timing signals that are synchronized in time with blanking intervals that occur between active portions of the video signals generated by said television system; an improved pulse-width-modulated converter which converts a source of direct voltage to a regulated supply of direct voltage having a minimum of perturbations occuring during active portions of the video, comprising:

a transformer having primary and secondary windings;

means responsive to said timing signals for generating an alternating voltage;

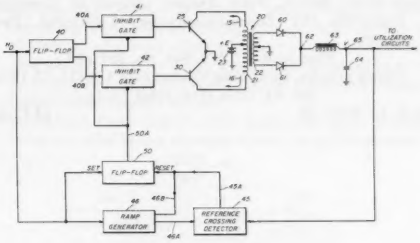
switching means coupled to said primary winding and responsive to said alternating voltage for alternately apply-

ing said unregulated source of direct voltage in opposite relative polarities across said primary winding;

rectifier means coupled to said secondary winding;

filter means for receiving the output of said rectifier means;

pulse generating means responsive to the voltage output level of said filter and said timing signals for generating a series of pulses which are in synchronism with said timing



signals and which have widths that vary as a function of said voltage output level;

means for limiting the width of said pulses so that said pulses are constrained to occur during said blanking intervals; and

inhibit means responsive to said pulses for inhibiting the application of said unregulated voltage across said primary winding during said pulses.

3,869,567

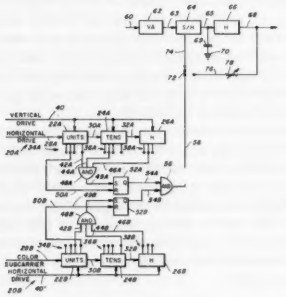
BLEMISH COMPENSATOR

Edward L. Covington, Rt. 3, Box 92, Claremore, Okla. 74017

Filed Aug. 20, 1973, Ser. No. 389,956

Int. Cl. H04n *5/21*

U.S. Cl. 178—7.2 **6 Claims**



1. In a video camera system having a camera tube with at least one blemish in the photosensitive surface, such that when the photosensitive spot being transduced is on the blemish area a distorted video signal is produced, the improvement in apparatus for compensating for said blemish, comprising:

a. first means to generate first recurrent timing pulses in synchronism with the start of each horizontal sweep;

b. second means to generate second recurrent timing pulses in accordance with the rate of horizontal sweep;

c. first counter means responsive to said first pulses;

d. second counter means responsive to said second pulses;

e. means responsive to said first counter means to generate a first control voltage pulses at a selected count and of selected pulse width;

f. means responsive to said second counter means to generate a second control voltage pulse at a selected count and of selected pulse width;

g. video amplifier means including sample and hold means connected to said camera tube; and

AND gate means having as its two inputs said first and second control pulses, the output pulse of said gate means connected to said sample and hold means.

3,869,568

SYNCHRONIZATION SEPARATOR CIRCUIT

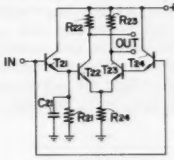
Seiichi Ueda, Tokyo, and Teruo Minagawa, Yokohama, both of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Mar. 12, 1973, Ser. No. 340,073

Claims priority, application Japan, Mar. 10, 1972, 47-23932

Int. Cl. H04n *5/08*

U.S. Cl. 178—7.3 S **5 Claims**



1. A synchronization signal separator circuit for deriving a synchronization signal from a compound video signal comprising a differential amplifier having first and second input terminals, a circuit input terminal receiving said compound video signal, and means for connecting said circuit input terminal to said first and second input terminals of said differential amplifier including D.C. level shift and peak value detector circuit means, wherein said D.C. level shift and peak value detector circuit means comprises a D.C. level shift circuit having its input connected to said circuit input terminal and a peak value detector connected between the output of said D.C. level shift circuit and said first input terminal of said differential amplifier, said circuit input terminal being connected directly to said second input terminal of said differential amplifier, and wherein said D.C. level shift circuit comprises first and second transistors having their emitters connected together through a first resistor to ground, the collector of said first transistor being connected to a power source, the collector of said second transistor being connected to the base thereof, a third transistor having its collector connected to its base and through a second resistor to said power source, the emitter of said third transistor being connected to the collector of said second transistor, and third and fourth resistors connected in series across the collector and emitter of said third transistor, the point of connection between said third and fourth resistors being connected to said peak value detector circuit.

3,869,569

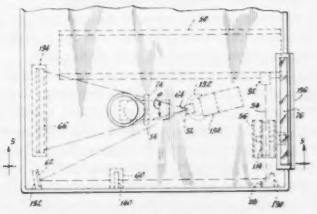
FACSIMILE TRANSCEIVING APPARATUS

Peter John Mason; Gary Lee Hutchinson; Lawrence Phillip Lavery; Vernon Edmund Punt, all of Fairport, and Roy Wilben Rivers, Conesus, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed May 16, 1972, Ser. No. 253,828

Int. Cl. H04n *3/00*

U.S. Cl. 178—7.6 **19 Claims**



1. A facsimile transceiving apparatus comprising:

a stationary scanning station;

means for advancing a document transversely of said scanning station;

means for repetitively deflecting a relatively stable light beam from one end to the other of said scanning station to scan said document;

detection means extending lengthwise of said scanning station and beyond the ends thereof for receiving light diffusely, but not specularly, reflected from said document to provide a video signal representative of said document;

an electrostatographic reproduction station including a photoreceptor surface, means for establishing a uniform electrostatic charge on said surface, means for repetitively deflecting a modulated light beam across said surface for establishing a latent electrostatic image on said surface, means for contacting said surface with pigmented developer particles, and means for transferring a developed image to a record medium; and

a common source of light for selectively supplying said relatively stable light beam and said modulated light beam.

3,869,570

SYSTEM FOR ANALYSING TELEGRAPH CHARACTERS

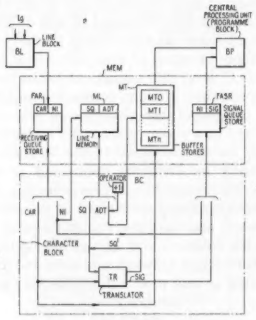
Thang Nguyen-Tat, Jouy-en-Josas; Roger Andre Pain, Vaires; Yann Le Floch, Fontenay-aux-Roses, and Jean-Claude Herluison, Argenteuil, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 11, 1973, Ser. No. 423,871

Claims priority, application France, Dec. 28, 1972, 72.46540

Int. Cl. H04l *3/00*

U.S. Cl. 178—26 R **4 Claims**



1. In a system for analyzing telegraph characters having a translator and an analyzing sequential device wherein each part of a telegraph message other than the intelligence part thereof is associated with a position of said sequential device and wherein said translator operates on the present position of said sequential device and a received telegraph character to produce at least a signal representing a new position for said sequential device, said translator comprising:

a main translator coupled to said sequential device, said main translator responding to said present position of said sequential device to produce said signal; and

an auxiliary translator coupled to said sequential device, to telegraph lines to receive telegraph messages over each of said lines and to the input of said main translator, said auxiliary translator having a number of inputs equal to the number of different telegraph characters of the alphabet employed and a plurality of outputs each of which provides a predetermined binary value having less binary bits than the number of binary bits forming each of said characters, said auxiliary translator responding to a position of said sequential device immediately preceding said present position of said sequential device to provide said predetermined binary values.

3,869,571

DEVICE FOR THE USE OF A FACSIMILE APPARATUS AS A PRINTING MECHANISM

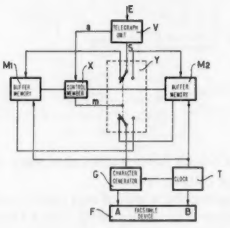
Jean-Henri Delavie, Paris, France, assignor to Compagnie Industrille Des Telecommunications Cit-Alcatel, Paris, France

Filed June 1, 1973, Ser. No. 366,143

Claims priority, application France, June 1, 1972, 72.19743

Int. Cl. G06f *3/14;* **H04l** *15/34*

U.S. Cl. 178—30 **13 Claims**



1. A device for the use of a facsimile apparatus as a printing mechanism for alphanumeric characters, adapted to write N characters per line, comprising telegraphic means for providing code signals representing alphanumeric characters, a character generator which furnishes order signals to said facsimile apparatus in response to code signals applied in parallel to the input thereof, first and second identical buffer memories having a capacity at least equal to N characters, charge control means connected to said telegraphic means for successively applying the code signals of each group of N characters alternately to said first and second buffer memories, and reading means for successively applying the code signals of N characters stored in the one of said first and second buffer memories which is not receiving code signals from said telegraphic means to the input of said character generator, said charge control means including

loading control means for aligning side by side in each buffer memory the codes of N characters forming one line of characters, said reading means including means for successively applying said codes of N characters from said buffer memories to the input of the character generator in the course of one scanning of the elementary line and means for repeating the reading operation in memory on *p* scanning lines corresponding to *p* lines of the character generator.

3,869,572

CHARGE COUPLED IMAGER

David L. Carter, Upper Montclair, N.J., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 214,365, Dec. 30, 1971, abandoned. This application Nov. 9, 1973, Ser. No. 414,484

Int. Cl. H04n *5/30*

U.S. Cl. 178—7.1 **5 Claims**

1. An optical imager system comprising:

a semiconductor substrate having a surface of insulating material,

a plurality of rows of optically active, substantially parallel first regions in said substrate respectively defining a charge transfer shift register device corresponding to each row,

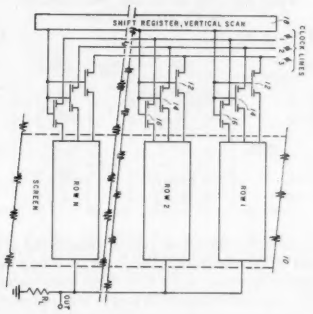
each of said charge transfer shift register devices cooperating to form a first metallization level disposed over said insulating suface of said substrate and providing a plural-

ity of substantially parallel spaced apart electrodes, sets of at least two successive electrodes cooperating to define respective bits of each said charge transfer shift register device,

an insulating layer disposed over said first level metallization and filling the spaces between adjacent electrodes, said insulating layer being provided with a plurality of apertures selectively exposing predetermined electrodes,

a second level of metallization defining a plurality of substantially parallel conductive strips overlying said insulating layer and extending through said apertures therein to selectively ohmically contact said electrodes, said plurality of conductive strips being arranged in sets of conductive strips corresponding to respective charge transfer shift register devices,

a multiphase clock source, said multiphase clock source being provided with a plurality of clock lines for transmitting different phase pulses, each of which is arranged for respective connection to each of the charge transfer shift register devices comprising the plurality of rows of said first regions in said substrate,



switching means interposed between each of said plurality of clock lines and the respective charge transfer shift register devices and operable to connect said plurality of conductive strips to said plurality of clock lines in a predetermined sequence to thereby couple said charge transfer shift register devices to the respective clock lines,

scanning means operably connected to said switching means for selectively addressing respective charge transfer shift register devices corresponding to respective rows of said optically active first regions of said substrate, and output means for detecting electrical charge resulting from the image detected by respective bits of said charge transfer shift register devices.

3,869,573

MULTIPOINT JUNCTION UNIT PROVIDING EXCLUSIVE INTERCONNECTIONS OF BRANCH PAIRS

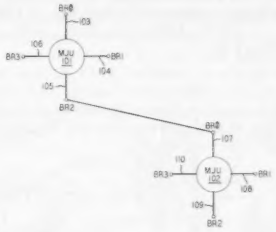
Leo Michael Kolensky, Irvington; Randolph John Pilc, Holmdel; Gabriel Gary Schlanger, West Orange, and Allan Howard Willand, Loch Arbour, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 7, 1974, Ser. No. 448,807
Int. Cl. H04l *11/00*
U.S. Cl. 178—73 **8 Claims**

1. A junction unit for terminating at least four two-way branch lines, the junction unit including a signal path interconnecting an incoming side of each branch line with an outgoing side of each of the other branch lines,

CHARACTERIZED IN THAT

the junction unit includes means individual to each signal path for selectively severing the individual signal path in response to concurrent reception of signals from either



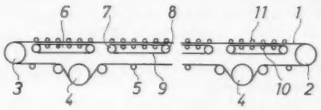
one of the branch lines interconnected by the signal path and from a different one of the branch lines.

3,869,574

BELT CONVEYOR APPARATUS

Takeshi Kume, Kobe, Japan, assignor to Ryuichi Mujamoto, Osaka, Japan

Filed Oct. 17, 1972, Ser. No. 300,417
Claims priority, application Japan, Mar. 6, 1972, 47-22871
Int. Cl. B65g *23/00*
U.S. Cl. 198—203 **7 Claims**



1. A belt conveyor apparatus comprising:

an endless major belt having at each opposite lateral edge portion thereof, on the underside of the upper run thereof, a single substantially flat contact surface, said lateral edge portions being thicker than the middle portion between said lateral edge portions;

non-driven guide rollers mounted for supporting said endless major belt;

a plurality of sub-belt means mounted for contacting said major belt at said opposite lateral edge portion contact surfaces only thereof for imparting rotation to said major belt, each of said sub-belt means comprising, adjacent each of said lateral edge portions of said major belt:

a driving pulley

a following pulley;

a sub-belt having a single outer substantially flat contact surface and mounted over said driving and following pulleys to be driven by said driving pulley, said sub-belt being substantially narrower than said major belt and being mounted to be in strong frictional contact at said flat contact surface thereof with the respective one of said lateral edge portion contact surfaces only of said major belt; and

at least one snap roller means mounted to contact the upper side of said upper run of said major belt at said respective lateral edge portion only thereof, said snap roller means comprising a freely rotatably mounted snap roller for pinching said major belt and said sub-belt together;

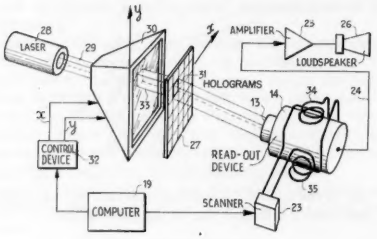
the lateral edge surfaces of said major belt being free from contact with said sub-belt means; and

said sub-belt means being spaced from and not in contact with the lower run of said major belt.

3,869,575
SPEECH-SYNTHESIS SYSTEM

Erich Spitz, and Michel Rembault, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 237,686, March 24, 1972, abandoned. This application Jan. 30, 1974, Ser. No. 437,873
Claims priority, application France, Apr. 2, 1971, 71.11741
Int. Cl. G10l *1/00*; G11c *13/04*
U.S. Cl. 179—1 SA **4 Claims**



1. Speech synthesis system for synthetizing acoustic messages made of a succession of elementary acoustic signals under the control of information data including addresses and a command signal for each of said acoustic signals; said system comprising:

holographic storage means including a plurality of elementary fringe patterns arranged side by side on a support;

illuminating means controlled by said addresses for directing toward any one of said fringe patterns a beam of monochromatic radiant energy;

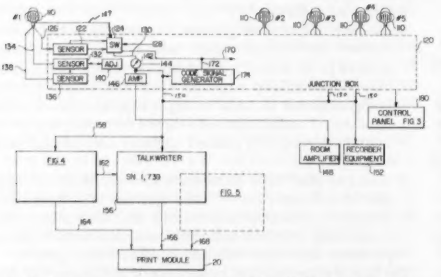
image analyser means including an input face positioned for receiving from any one of said fringe patterns an image of said acoustic signals upon illumination thereof by said beam, a scanner device ensuring scanning of said face under the triggering action of said command signal and an electrical output;

and electro-acoustical means, having an electrical input coupled to said electrical output, for delivering said acoustic messages.

3,869,576
MECHANICAL STENOGRAPHIC APPARATUS FOR TRANSCRIBING GROUP PROCEEDINGS

David Thurston Griggs, 5128 S. Rolling Rd., Baltimore, Md. 21227

Continuation-in-part of Ser. No. 1,739, Jan. 9, 1970, Pat. No. 3,646,576, which is a continuation of Ser. No. 252,569, May 12, 1972, abandoned. This application Mar. 19, 1974, Ser. No. 452,695
Int. Cl. H04m *1/00*
U.S. Cl. 170—1 SE **11 Claims**



1. A data processing method for identifying separate input sources of voice signals and converting them to correspondingly identified sequences of input signals for alphanumeric print-out means comprising the steps of:

1. receiving voice signals from a plurality of signal input positions,

2. indicating at the respective input stations the intervals when unsuitable weakness of input signals occurs,

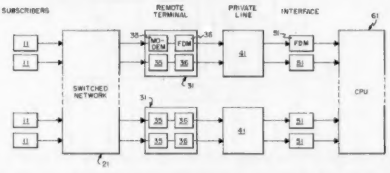
3. passing the voice signals both through an amplifier for aural monitoring and editing and passing them also to a talkwriter system for processing the voice signals into alpha-numberic signals cognizant by a print module, and

4. identifying alpha-numberic outputs of the print module by the respective one of a plurality of signal input positions whence it was received.

3,869,577
METHOD AND APPARATUS FOR CONTROL SIGNALING IN FDM SYSTEM

Robert A. Couturier, Stamford; Steven J. Davis, Ridgefield, and G. Howard Robbins, New Canaan, all of Conn., assignors to General Datacomm Industries, Inc., Norwalk, Conn.

Filed Apr. 24, 1972, Ser. No. 246,589
Int. Cl. H04m *11/06*
U.S. Cl. 179—2 DP **15 Claims**



1. In a data communication system comprising at least first and second FDM transmitter/receivers in which dial access control signals received at the first FDM transmitter/receiver from a first data communication means are transmitted to the second FDM transmitter/receiver for application to a second data communication means and dial access control signals received at the second FDM transmitter/receiver from the second data communication means are transmitted to the first FDM transmitter/receiver for application to the first data communication means,

first apparatus at the first FDM transmitter/receiver for transmitting to the second FDM transmitter/receiver at a special frequency other than that used for transmitting MARK or SPACE signals or their center frequency dial access control signals received from the first data communication means, said first apparatus further comprising means for transmitting the special frequency signal only when at least one of a RING signal and a DATA SET READY signal is received from the first data communication means and no CARRIER DETECT signal is received from the first data communication means; and

second apparatus at the second FDM transmitter/receiver for forming a CARRIER DETECT signal for application to the second data communication means by producing said CARRIER DETECT signal only when signal energy is received from the first FDM transmitter/receiver that is not the special frequency signal.

3,869,578
COMMUNICATIONS PROCESSOR SYSTEM HAVING A TIME SHARED COMMUNICATIONS CONTROL DEVICE AND MODEM

Barry M. Epstein, Dallas, Tex., assignor to Action Communication Systems, Inc., Dallas, Tex.

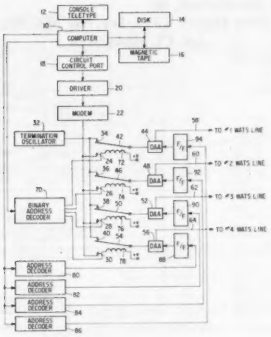
Filed Mar. 28, 1973, Ser. No. 345,703
Int. Cl. H04h *11/06*
U.S. Cl. 179—2 DP **9 Claims**

1. In a communications processor system wherein a message switching digital computer controls the transmission of digitally coded data to communication terminals connected to a plurality of communications lines, the combination comprising:

a communications control system connected to the output of the digital computer for generating electrical digital signals,

a modem connected to the output of said control system for converting said digital signals into digital tone signals,

a plurality of dialers each corresponding with one of said communications lines and operable by the digital computer to generate dialing address signals for said terminals connected to said communications lines, and



decoder means operable by address signals transmitted from the computer in conjunction with operation of said dialers for switching the output of said modem to selected ones of the communications lines which have been interconnected with selected terminals by said dialing address signals, wherein ones of said communications lines are sequentially connected to the output of said modem while dialing by said dialers is occurring on the remainder of said communications lines.

3,869,579

APPARATUS FOR MUTUALLY SYNCHRONIZING OSCILLATORS IN SWITCHING CENTERS OF A TELECOMMUNICATION NETWORK

Otto Karl, Forstenrieder allee 78/III, 8000 Munchen 71, Germany

Filed Oct. 3, 1972, Ser. No. 294,513

Claims priority, application Germany, Oct. 6, 1971, 2149911

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 BS **6 Claims**

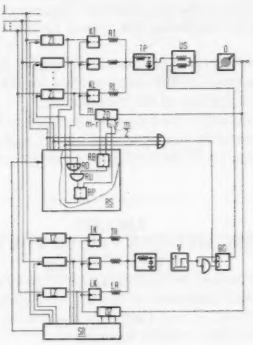
1. Apparatus for mutually synchronizing central office clock oscillators in each of a plurality of interconnected switching centers constituting a telecommunication network, the apparatus in each switching center comprising:

adjustable clock oscillator means having an output frequency which is adjustable in value in dependence on the value of a synchronizing signal,

first and second synchronizing circuits for producing synchronizing circuit output signals responsive to phase comparisons between said adjustable clock oscillator and the clock oscillator outputs of others of said switching centers connected to the defined switching center,

each said synchronizing circuit comprising a plurality of line frequency dividers, each of which receives one of said clock oscillator outputs from said other switching centers and produces frequency-divided outputs therefrom, a central office frequency divider for producing a divided-output signal from said adjustable clock oscillator output, a plurality of phase comparators, each of which compares the output from one of said line frequency dividers with the output from said central office divider and produces an output signal of a value corresponding to the phase difference therebetween, adding means for producing an output signal of a value corresponding to the sum of said phase comparator output signals and means for producing the synchronizing circuit output signal from said adding means output signal,

said first synchronizing circuit including means for producing an output signal having a control range corresponding to the phase difference between said adjustable clock oscillator and the clock oscillator in at least one of said other switching centers conditioned by the greatest possible no-load frequency difference between said adjustable clock oscillator and the clock oscillator in said at least



one other switching center, the generation of a reference phase occurring upon the crossing of said control range by said first synchronizing circuit output signal,

said second synchronizing circuit including means for producing an output signal having an operating range corresponding to the phase difference between said adjustable clock signal and the clock signal from said at least one other switching center and the greatest possible propagation time variation in a line connecting two of said switching centers and

means for combining said first and second synchronizing circuit output signals for producing said synchronizing signal.

3,869,580

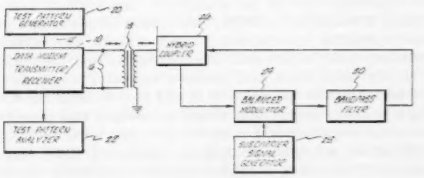
APPARATUS FOR TESTING DATA MODEMS WHICH SIMULTANEOUSLY TRANSMIT AND RECEIVE FREQUENCY MULTIPLEXED SIGNALS

Robert Gordon Ragsdale, Hollywood, Calif., assignor to Milgo Electronic Corporation, Miami, Fla.

Continuation of Ser. No. 198,876, Nov. 15, 1971, abandoned. This application June 28, 1973, Ser. No. 374,695

Int. Cl. H04j *3/12*

U.S. Cl. 179—15 BF **4 Claims**



1. In an apparatus for testing a data modem wherein the modem includes a transmitter portion for receiving digital data on a data input circuit, modulating a carrier signal in

response to the data and transmitting the modulated carrier signal within one of two selectable frequency ranges over a telephone line and a receiver portion for simultaneously receiving from a telephone line a modulated carrier signal within the other frequency range not then being utilized by the transmitter, demodulating the received signal to derive digital data and producing a digital output signal on a data output circuit, the testing apparatus being separate from the modem per se and comprising:

means for applying a predetermined data signal on the data input circuit;

frequency translating means independent of the data modem and coupled to the data modem through at least one telephone line for receiving the transmitted signal at either one of the two selected frequency ranges and automatically translating the signal to the other frequency range;

means for applying the translated signal at said other frequency range to the telephone line for transmission to the receiver portion of the modem; and

means coupled to the data output circuit of the data modem for comparing the input and output signals to check the performance of the modem operating over said telephone line.

3,869,581

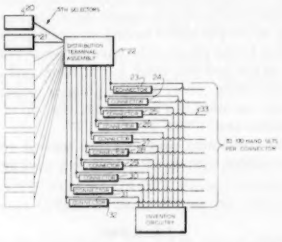
TELEPHONE ALLOTTER CIRCUIT FOR EQUALIZING CIRCUIT USAGE

Harold L. Paschal, Jr., and Graham T. Brown, both of Richlands, N.C., assignors to Horace R. Mazingo, Richlands; Alex Warlick, Jr. and Carl S. Milsted, both of Jacksonville, all of, N.C., part interest to each

Filed Sept. 7, 1973, Ser. No. 395,360

Int. Cl. H04m *3/22*

U.S. Cl. 179—18 H **2 Claims**



1. In a telephone switching system having a main switching system to selectively connect telephone handsets, such main system including a plurality of "connectors" each having a control lead, plural groups of handsets connected to each connector, a distribution terminal assembly, and "fifth selectors" connected through said distribution terminal assembly to said connectors in a predetermined first choice wiring array, in combination therewith, an auxiliary control system for equalizing wear on the connectors, said auxiliary system having a switching network, permanent connections from each connector control lead to said network and auxiliary switching means within said network responsive to the seizure of said control leads, said auxiliary switching means being connected within said network to said control leads and having a potential source and means to connect said potential source to respective said control leads whereby as each control lead for each connector in each connector group is seized, used and released in a normal manner, a substitute barring potential is placed thereon and such barring potentials are maintained for all such seized control leads after the same become seized, used and released in the normal manner, and further having means to disconnect said potential source from said control leads and thereby disconnect said barring potentials from all said control leads associated with the connector group but only after all the control leads have been so seized, used and released whereby to insure that no connector in the group is seized, used and released again until all connectors in the group have been so utilized.

3,869,582

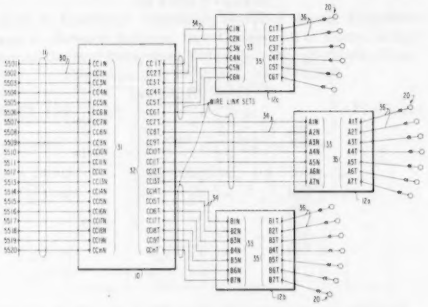
INTRABUILDING TELEPHONE SYSTEM

Marion L. Humphrey, Bellwood, and Ernest A. Tugaudis, Mount Prospect, both of Ill., assignors to Allstate Insurance Company, Northbrook, Ill.

Filed June 4, 1973, Ser. No. 366,391

Int. Cl. H04q *1/14*

U.S. Cl. 179—98 **6 Claims**



1. An intrabuilding telephone system for a building structure comprising in combination

a central control panel within the building for connection to the commercial telephone system located external to the building, said central control panel having first and second junction arrays with each junction in said first array being connected to an incoming telephone line of said commercial telephone system,

a plurality of remote distribution panels spaced throughout said building, each remote distribution panel provided with third and fourth junction arrays,

a plurality of telephone connection jacks located at discrete physical locations throughout the building,

a telephone line wiring connection between each telephone connection jack and a preselected junction of said fourth junction array, each of said telephone line wiring connections constituting a permanent electrical installation in said building,

a plurality of wire link sets, there being at least one wire link set between each of said remote distribution panels and said central control panel, each wire link set being constituted by wire connection means connected between a selected group of junctions in said second array and corresponding junctions in said third array in said remote panels, respectively, said wire link sets constituting a permanent electrical wiring installation in said building, a first plurality of patching jumpers, each patching jumper including a telephone wire line and plugs at each end thereof, said plugs being receivable in said receptacles, located within said central panel, each of said patching jumpers and plugs forming a telephone line connection between one junction of said first junction array and one junction of said second junction array,

and a plurality of further patching jumpers and plugs located within each of said remote distribution panels, each further patching jumper and plug forming a further telephone line connection between one junction of said third junction array and one junction of said fourth junction array when the plugs at the ends thereof are in the receptacles of said junctions, respectively,

each junctioon in said junction arrays being a receptacle for one of said plugs of said patching jumpers.

3,869,583

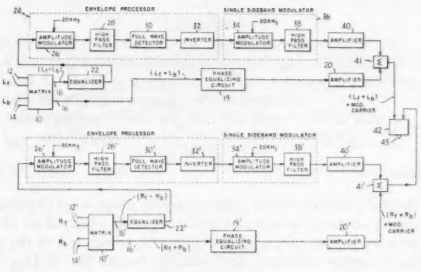
QUADRUPHONIC DISC RECORDING SYSTEM UTILIZING SINGLE SIDEBAND MODULATION

Benjamin B. Bauer, Stamford; Daniel W. Gravereaux, Wilton, and Emil L. Torick, Darien, all of Conn., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Continuation of Ser. No. 169,219, Aug. 5, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 428,294

Int. Cl. G11b *3/74*

U.S. Cl. 179—100.4 ST **2 Claims**



1. Apparatus for recording four channel signals in a single groove cut in a record disc, said apparatus comprising:

matrix circuit means for producing first and second signals representative of the sum and the difference, respectively, of the first and second channel signals and also third and fourth signals representative of the sum and difference, respectively, of the third and fourth channel signals,

first and second envelope processor means to which the second and fourth difference signals produced by said matrixing circuit means are respectively applied,

each of said envelope processor means including amplitude modulator means for modulating a carrier signal in accordance with the amplitude of the applied difference signal,

filter means for transmitting the upper sideband of the amplitude modulated signal, and

detector means for detecting the envelope of the upper sideband with carrier signal to produce a distorted replica of the difference signal,

first and second equalizing circuit means for respectively attenuating the low frequency components of the second and fourth difference signals prior to application to the amplitude modulator means of their respective envelope processor means to compensate for the presence of lower sideband signal information in the output of said filter means,

first and second output single sideband modulator means for modulating a respective carrier signal in accordance with the distorted replica of the difference signal produced by said first and by said second envelope processor means, respectively, to produce single sideband with carrier signals having envelopes corresponding to their respective difference signals, said carrier signals each having a frequency such as to cause the upper sidebands of said modulated signals to be outside the frequency range of said first and third sum signals,

first means for combining the first sum signal with the upper sideband of the single sideband with carrier signal produced by said first output single sideband modulator means,

second means for combining the third sum signal with the upper sideband of the single sideband with carrier signal produced by said second output single sideband modulator means, and

means for simultaneously recording the output signal of said first combining means on one wall of a single groove of the record disc and the output signal of said second combining means on the other wall of the groove.

3,869,584

HEADSET

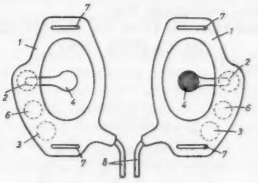
Helmut Wilde, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 11, 1973, Ser. No. 368,799

Claims priority, application Germany, June 22, 1972, 2230637

Int. Cl. H04m *1/05*

U.S. Cl. 179—156 **9 Claims**



1. A headset to be worn at an ear of a user and in contact with a jaw bone of said user comprising:

two annular half shells being bonded together to form a ring-like collar having an opening encircling the external portion of said ear of said user;

a receiver disposed within said collar adjacent said ear of said user;

a bone conduction actuated microphone disposed within said collar adjacent said jaw bone of said used, said microphone being actuated by body-borne sound in the vicinity of said jaw bone; and

a horn-type sound conductor disposed within said shells coupled to said receiver and extending into approximately the middle of said opening of said collar to transmit sound radiated by said receiver to the entrance of said ear of said user.

3,869,585

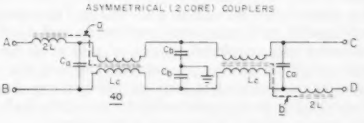
ASYMMETRIC QUADRATURE HYBRID COUPLERS

Richard V. Snyder, West Caldwell, N.J., assignor to Lorch Electronics Corporation, Englewood, N.J.

Filed Dec. 19, 1972, Ser. No. 316,500

Int. Cl. H04m *1/00*

U.S. Cl. 179—173 **11 Claims**



1. An asymmetric quadrature hybrid coupler comprising a first and a second pair of ports, a first pair of coupled inductors each inductor of which is in circuit with an individual port of said first port pair, a second pair of coupled inductors each inductor of which is in circuit with an individual port of said second port pair, a first series inductor in conductive electrical connection with one inductor of said first inductor pair, a second series inductor in conductive electrical connection with one inductor of said second inductor pair, said one inductor of said first inductor pair and said first series inductor being in conductive connection with the second inductor of said second inductor pair between corresponding ports of said port pairs, the second inductor of said first inductor pair and said second series inductor being in conductive connection

with the said one inductor of said second inductor pair between the remaining corresponding ports of said first and second port pairs, said two series inductors and said two pairs of coupled inductors being the sole operative inductances of the coupler, being connected in electrical asymmetric array, and being electrically proportioned to provide effective performance as an asymmetric coupler that is equivalent to that of a corresponding symmetrical coupler.

3,869,586

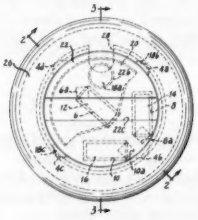
MINIATURE WRIST WATCH SWITCH

Roman J. Patz, Wauwatosa; Frank O. Sell, Milwaukee, and Werner B. Halbeck, Mequon, all of Wis., assignors to Cutter-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 28, 1974, Ser. No. 455,923

Int. Cl. H01h *19/50*

U.S. Cl. 200—11 G **12 Claims**



1. A miniature switch adapted to be mounted within a hole in the case of electric and electronic wrist watches for time-setting purposes comprising:

a generally flat insulating base having a shallow cavity therein and a plurality of holes extending from said shallow cavity through the bottom of said base;

a generally flat insulating contact carrier movably retained in said shallow cavity;

a flat movable contact recessed in the lower surface of said contact carrier for movement by the latter;

a plurality of integral contact-terminals, each having a terminal portion extending down through one of the holes in said base and a resilient stationary contact portion in the bottom of said shallow cavity for engagement by said movable contact;

a generally flat metal knob fixed to said contact carrier for moving the movable contact and having a peripheral portion abutting the peripheral portion of said base about said shallow cavity;

a seal;

and a metal frame secured to said base and clamping said seal against said peripheral portion of said knob and retaining said peripheral portion of said knob between said peripheral portion of said base and said seal while allowing relative knob movement therebetween, and said frame having an external configuration fitting the hole in the case in which it is adapted to be mounted.

3,869,587

GROUNDING AND TESTING DEVICE FOR ELECTRICAL SWITCHGEAR

George Caton, Ilkley, England, assignor to Yorkshire Switchgear and Engineering Co., Limited, Meanwood, Leeds, England

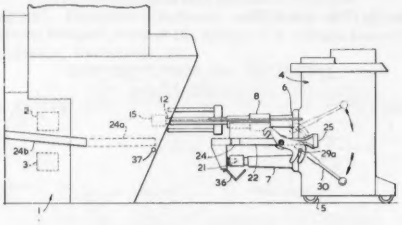
Filed Feb. 25, 1974, Ser. No. 445,606

Claims priority, application Great Britain, Mar. 6, 1973, 10870/73

Int. Cl. H01h *9/22*

U.S. Cl. 200—50 AA **6 Claims**

1. A grounding and testing device for use in electrical switchgear having a stationary housing with two sets of primary supply sockets for feeder and busbar circuits respectively and a movable housing with two sets of primary supply plugs for connection to the sockets and connected to the contacts of switching means in the movable housing, the device comprising a carrier, a set of primary supply extension plugs mounted on the carrier for engaging at one end thereof a set of the primary supply sockets and at the other end



thereof a first set of the primary supply plugs, a set of primary supply contacts on said carrier for engaging a second set of the primary supply plugs, ground contacts connected to the primary supply contacts, first locking means for locking the carrier in position on the movable housing, and second locking means for locking the carrier in position on the stationary housing.

3,869,588

POSITIVE OR NEGATIVE ACCELERATION OPERATED CONDUCTIVE LIQUID SWITCH FOR VEHICLE SAFETY DEVICES

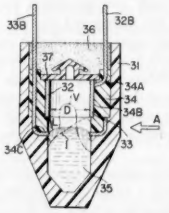
Susumu Ubukata, 549, Nakasuna-cho, and Yasukazu Mizutani, both of Nagoya, Japan, assignors to said Ubukata, by said Mizutani

Filed Feb. 2, 1973, Ser. No. 329,168

Claims priority, application Japan, Feb. 10, 1972, 47-14491; May 11, 1972, 47-47529; May 25, 1972, 47-52858; June 24, 1972, 47-63485; June 19, 1972, 47-72330

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.47 **8 Claims**



1. A positive or negative acceleration operated conductive liquid switch for a horizontally moving apparatus which comprises: at least one sealed container which is to be mounted on the horizontally moving apparatus and has electrically conductive contact means to selectively open and close at least one electrical circuit to provide respectively first and second operating modes thereof; and electrically conductive fluid contained in the sealed container and adapted to electrically communicate with the electrically conductive contact means, the electrically conductive contact means and the electrically conductive fluid being arranged so that the electrically conductive contact means operates to selectively connect the electrical circuit in the first of said operating modes upon only gravity being applied to the electrically conductive fluid, but, when acceleration in a horizontal direction and the gravity are simultaneously applied to the electrically conductive fluid, the

electrically conductive fluid is deformed to cause the electrically conductive contact means to connect the electrical circuit in the second of said operating modes both in the case where a first acceleration in a horizontal direction exceeding a first threshold value which is relatively low is applied in one direction for a first duration period which is relatively long and in the case where a second acceleration in a horizontal direction exceeding a second threshold value which is relatively high is applied in one direction for a second duration period which is relatively short.

3,869,589

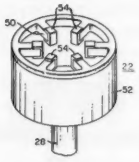
VACUUM INTERRUPTER INCLUDING CONTACTS HAVING IMPROVED WELD BREAK CHARACTERISTICS

Richard L. Hundstad, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 249,992, June 3, 1972. This application Nov. 16, 1973, Ser. No. 416,470

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **4 Claims**



1. A vacuum type circuit interrupter comprising:
a highly evacuated tubular insulating envelope;
a first contact structure disposed within said tubular insulating envelope;
a second contact structure disposed within said tubular insulating envelope being movable between a first position in contact with said first contact structure and a second position spaced from said first contact structure to establish an arcing gap therebetween across which an arc is formed during circuit interruption;
said first contact structure comprising a main body portion having a flat circular cross sectional configuration, a plurality of support means attached to said flat planar main body portion in a spaced apart generally circular configuration each extending radially inward from the circumference of said main body portion, a contact surface formed at the free end of each of said support means being separated from other contact surfaces by a sufficient distance so as to inhibit arc movement therebetween, each of said plurality of support means extending from said flat circular body portion at an acute angle with said flat circular body portion, each of said plurality of support means being separated from every other support means by a circumferential spacing which is dependent on the radial position and decreases as the radial position decreases; and,
said second contact structure being a mirror image of said first contact structure.

3,869,590

DOUBLE-POLE TOOL HANDLE SWITCH

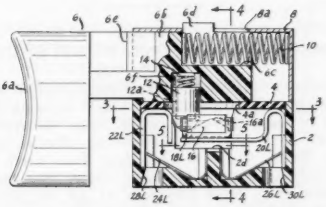
Harold W. Hults, New Berlin, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Feb. 28, 1974, Ser. No. 447,031

Int. Cl. H01h *9/06, 5/10*

U.S. Cl. 200—157 **9 Claims**

1. A double-pole tool handle switch comprising:
an insulating housing;
a return spring biased switch actuator mounted for sliding movement on said housing;
a plunger extending from said switch actuator;
a spring biasing said plunger and said plunger being resiliently depressible against the force of said bias spring;
a movable contact actuator block having a double-incline camming surface comprising opposite inclines meeting at a high point arranged for engagement by said plunger;
double-pole butt contacts comprising a pair of stationary contacts mounted in said housing and a pair of movable contacts carried by said actuator block for engaging the respective stationary contacts, and the contacting portions of said stationary and movable contacts being generally parallel to the axis of said plunger, said stationary contacts having terminals adapted for connection to an external circuit;
and connector means comprising a pair of connector terminals and means mounting them in said housing and adapted to be connected to an external circuit and having biasing portions remaining in contact with the respective movable contacts throughout the movement of said actuator block and applying a counter bias to said actuator block to balance the bias of said plunger spring;



and actuation of said switch actuator causing said plunger to slide up the front incline of said camming surface and, after passing over said high point, to cause snap-action movement of said actuator block while said biased plunger acts on said rear incline and said movable contacts remain in sliding contact with said biasing portions of said connector terminals thereby to cause said movable contacts to close with the respective stationary contacts with minimum bounce;
and further actuation of said switch actuator causes said plunger to move further down the rear incline to allow said counter bias to afford controlled wiping between said movable and stationary contacts;
and release of said switch actuator to return under force of its return spring causing said plunger to slide up the rear incline of said camming surface and at the same time to cause movement of said actuator block against said counter bias to afford controlled wiping between said movable and stationary contacts and, upon reaching said high point at maximum contact pressure, causing said contacts to trip open with snap-action as said biased plunger acts on the front incline of said camming surface thereby to prevent teasing of said contacts.

3,869,591

TRIGGER SWITCH WITH LATCH AND VERNIER SPEED ADJUSTING SHAFT

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler Hammer, Inc., Milwaukee, Wis.

Filed July 31, 1973, Ser. No. 384,258

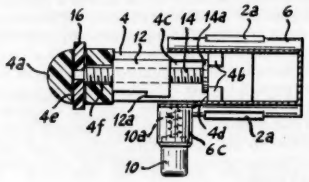
Int. Cl. H01h *9/06, 21/10*

U.S. Cl. 200—321 **5 Claims**

1. In a trigger switch the combination comprising a housing; a spring-biased trigger slidable mounted for a slidable movement on the housing and having a recessed wall portion a lock pin mounted on the housing; the improvement comprising:

vernier adjusting means and means mounting it in the trigger comprising:

an adjustable block having a catch in removable engagement with the lock pin;



a shaft threaded through said block, carried by said trigger and having a rear end abutting and rotatable on said recessed wall portion to take up the force of the trigger return spring when the lock is engaged in said catch;

and an adjusting wheel on the forward end of said shaft for rotating said shaft to adjust the position of the trigger relative to said block.

3,869,592

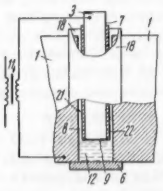
METHOD OF ELECTROSLAG WELDING OR HARDFACING

Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Boris Izrailevich Medovar, ulitsa Anri Barbjusa 22/26, kv. 109; Leonid Gustavovich Puzrin, ulitsa Solomenskaya, 16, kv. 58; Avram Shaevich Gorodetsky, ulitsa Krasnoarmeiskaya, 80 kv. 56, all of Kiev; Jury Yakovlevich Ischenko, Pereulok Krasny, 7, Kievskaya Oblast; Igor Stepanovich Pryanishnikov, ulitsa Nikolaeva 23, kv. 49, Moskovskaya Oblast; Vladimir Nikiforovich Zhuchin, ulitsa Pervomaiskaya 48, kv. 43, Moskovskaya Oblast; Valentin Vasilievich Topilin, ulitsa Mira 6, kv. 29, Moskovskaya Oblast; Mikhail Markovich Kljuev, ulitsa Mira 2, kv. 77, Moskovskaya Oblast; Vladimir Sergeevich Laktionov, ulitsa Nikolaeva 23, kv. 5, Moskovskaya Oblast; Jury Grigorievich Grebtsov, ulitsa Gorkogo 5, kv. 5, Moskovskaya Oblast; Igor Vasilievich Perepelitsa, ulitsa Nikolaeva 54, kv. 6, Moskovskaya Oblast; Nina Petrovna Fomicheva, ulitsa Nikolaeva 31, kv. 20, Moskovskaya Oblast; Georgy Alexandrovich Boiko, ulitsa Vladimiro-Lybedskaya, 16, kv. 106, Kiev; Anatoly Antonovich Kirsenko, ulitsa Parkhomenko, 17, Kievskaya Oblast; Dmitry Pavlovich Rozanov, Polyarny proezd, la, kv. 13, and Stanislav Vasilievich Karlov, ulitsa Koreshkova, 6, kv. 5, both of Moskovskaya, all of U.S.S.R.

Filed June 20, 1973, Ser. No. 371,692

Int. Cl. B23k *25/00*

U.S. Cl. 219—73 **6 Claims**



1. A method of electroslag welding or hardfacing of workpieces comprising: mounting a stationary electrode having its length a constant cross-sectional area equal to that of deposited metal at a normal temperature between moulding parts and workpieces being processed so that spaces being equal to the thermal expansion of the electrode when heated to its melting point are formed between said moulding parts, workpieces and electrode, and a free cavity is formed between the bottom end of the electrode and moulding parts encompassing said electrode and the workpieces; connecting said electrode and the workpieces to different terminals of a power source; filling said cavity with molten slag; and passing an electric current between the electrode and workpieces to heat the molten slag and to melt the bottom end of the electrode and the edges of the workpieces.

3,869,593

HEATING DEVICE

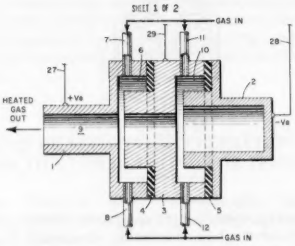
George William New, Middlesbrough, and Alan Lawrence Hare, Redcar, both of England, assignors to British Titan Limited, Billingham, Teesside, England

Filed Nov. 21, 1972, Ser. No. 308,503

Claims priority, application Great Britain, Dec. 9, 1971, 57155/71

Int. Cl. B23k *9/00*

U.S. Cl. 219—121 P **17 Claims**



1. A heating device comprising a pair of axially spaced principal electrodes, at least one of which is hollow and has an outlet for a gas; said principal electrodes being connected to a high energy electric current; an intermediate hollow electrode located between said pair of principal electrodes and electrically insulated therefrom; a control circuit comprising a control switch and a current flow sensing device connected between one of said principal electrodes and said intermediate electrode such that said current flow sensing device senses the current flowing between one of said principal electrodes and said intermediate electrode; an operating switch electrically connected to said control switch and operable to render said control switch nonconductive when the current between one of said principal electrodes and said intermediate electrode is sensed to have fallen below a predetermined value; gas inlet means disposed between each of said principal electrodes and said intermediate electrodes for introducing gas into said hollow intermediate and said hollow principal electrodes.

3,869,594

HAND COVERING WITH HEATING MEANS THEREIN

Edgar E. Shively, 2843 Gawain Ave., Indianapolis, Ind. 46208

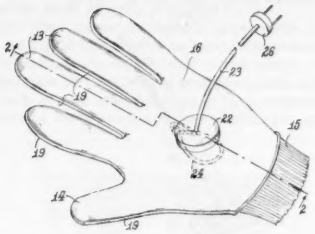
Filed Jan. 7, 1974, Ser. No. 431,497

Int. Cl. H05b *1/00*; **F24h** *1/00*

U.S. Cl. 219—211 **4 Claims**

1. A heated covering for the hand comprising a hand glove casing including a main body, thumb and finger portions, a water filled heating chamber integrally connected to said glove casing, a filling opening in said heating chamber, a cap on said filling opening, an electrical heater element within said heating chamber, and an insulated electric cord for connect-

ing said heater element with a source of electric current, said cord extending through said cap and affording a mounting for



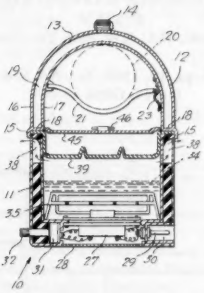
the heater element whereby the latter may be withdrawn through the filling opening upon removal of the cap.

3,869,595

INSULATED HEATED LUNCH BOX

Walter Collins, 9543 Achates Cir., Sacramento, Calif. 95826, and Howard Blankumsee, 232 Olmstead Dr., Sacramento, Calif. 95838

Filed June 19, 1974, Ser. No. 480,940
Int. Cl. A21b *1/52*; **F27d** *11/02*
U.S. Cl. 219—387 **6 Claims**



1. An insulated heated lunch box comprising a lower compartment unit having spaced dual walls and insulation positioned between said dual walls, an upper compartment unit including spaced dual walls and insulating material between said upper unit spaced dual walls, a peripheral flange on said upper unit engaging over said lower unit, means for detachably securing said upper unit to said lower portion an electric heater in said lower unit for heating water contained in said lower unit, electrical control means for controlling the amount of heat dissipated from said electric heater, rack means in said lower unit immersed in the water therein for supporting a plurality of food containers therein, a food tray, means on said food tray for supporting said food tray on said lower unit above the water level therein, and a cover for said food tray.

3,869,596

COOKWARE HEATER

John R. Howie, Killingworth, Conn., assignor to Safeway Products Inc., Middletown, Conn.

Filed Sept. 28, 1973, Ser. No. 401,681
Int. Cl. F27d *11/02*
U.S. Cl. 219—438 **9 Claims**

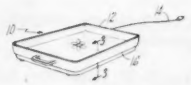
1. A cooking unit including:

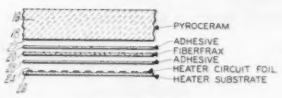
a cooking element formed of material selected from the group consisting of glass, ceramic and metal;

a base portion part of said cooking element having a mat surface and being electrically insulating;

a layer of dielectric material bonded to said mat surface of the base portion;

electro-conductive circuit foil means adhesively bonded to said layer of dielectric material, the coefficient of thermal expansion of said foil means being not less than the coefficient of the thermal expansion of said base portion and not more than ten times the coefficient of thermal expansion of said base portion; and





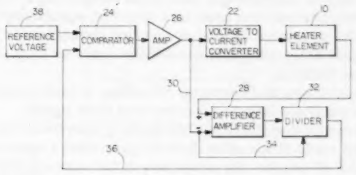
a layer of adhesive material bonding said circuit foil means to said layer of dielectric material, said adhesive remaining flexible after curing.

3,869,597

SELF-REGULATING PROPORTIONALLY CONTROLLED HEATING APPARATUS AND TECHNIQUE

Maxwell G. Strange, Fulton, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 27, 1974, Ser. No. 446,569
Int. Cl. H05b *1/02*
U.S. Cl. 219—505 **5 Claims**



1. A self-regulating controlled heating apparatus, said apparatus comprising:

an a electrical resistance heating element having a temperature coefficient of resistance;

current generator means coupled to said heating element for continuously current driving said heating element, said current generator means being responsive to an error signal to modify the level of the current drive; and

error signal generator means coupled to said heating element, said error signal generator means monitoring the voltage drop across said heating element and deriving an error signal therefrom representative of only that component of the voltage drop attributable to a change in actual temperature of said heating element from a desired reference temperature;

said error signal generator means further being connected in a feedback loop to said current generator means such that said error signal continuously effects a modification of the level of the current drive from said current genera-

tor means to return said heating element to said reference temperature.

3,869,598

METHOD FOR READING A DATA RECORD AND A DEVICE FOR PERFORMING THE METHOD

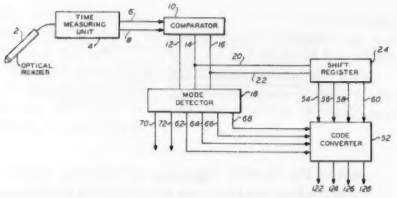
Gosta R. Englund, Stockholm, and Rune L. Myren, Spanga, both of Sweden, assignors to Svenska Dataregister AB, Solna, Sweden

Filed Apr. 9, 1973, Ser. No. 349,337

Claims priority, application Sweden, Apr. 12, 1972, 4723/72

Int. Cl. G06k *7/08;* **G01n** *21/30;* **G06k** *7/14;* **G08c** *13/00*

U.S. Cl. 235—61.11 R **3 Claims**



1. Device for reading a data record attached to a salable article of merchandise, said data record having a code recorded thereon consisting of markings comprising a series of bars representing different characters, relative movement between a reading device and said data record causing said code to be read comprising:

a time measuring unit connected to the outputs of said reading device for emitting signals representing the spacing between said markings;

a comparator connected to said time measuring unit for comparing the signals generated by said time measuring unit and for emitting signals representative of the distance between adjacent bars in said markings according to a predetermined format;

said format comprising a first signal designating a first distance between two code bars; a second signal designating a distance twice as long as said first distance and a third signal designating a distance four times as long as said first distance;

a mode of operation detector connected to said comparator for receiving said first, second and third signals;

a converter connected to said mode of operation detector; said mode of operation detector generating a signal indicative of whether the characters in the code are independent of each other and thus separated from each other an arbitrary distance or dependent on each other in such a manner that one marking forms the end of a character and the beginning of an adjacent character, said converter being arranged to convert said first, second and third signals to signals representing the different characters in the code.

3,869,599

OPTICAL PEN FOR HAND SCANNING DIGITALLY ENCODED RECORDS

Ronald P. Sansone, Floral Park, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 27, 1973, Ser. No. 391,618

Int. Cl. G06k *7/14, 19/06;* **G01n** *21/30*

U.S. Cl. 235—61.11 E **18 Claims**

1. Apparatus for reading coded records from which light is selectively reflected, the combination comprising:

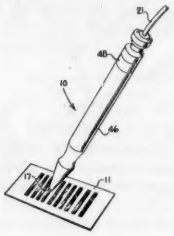
a longitudinal support means;

light means secured to said support means;

photosensitive means secured to said support means;

a removable tip secured to a first end of said support means;

a lens received at the distal end of said tip;



means for conveying light from said light means to said lens whereby a beam of light may be directed to a coded record when said lens is in optical communication therewith; and

means for collecting light that is reflected from the coded record through said lens and for conveying the light to said photosensitive means.

3,869,600

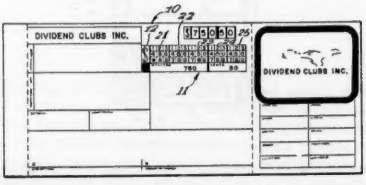
MANUAL CHARACTER MARKING RECOGNITION SYSTEM

Albert M. Hochstadt, 8861 S.W. 85th Ter., South Miami, Fla. 33143

Filed Sept. 10, 1969, Ser. No. 856,678

Int. Cl. G06k *19/00*

U.S. Cl. 235—61.12 N **9 Claims**



1. A business form for use in a character recognition system comprising:

a manual marking field having a three by three matrix of nine marking spaces for each numeral in a number, said matrixes being arranged side *b* side in a line.

3,869,601

COMPUTING APPARATUS FOR TRACKING MOVING OBJECTS

Eric Metcalf, Ropley, England, assignor to The Solartron Electronic Group Limited, Hampshire, England

Filed June 20, 1973, Ser. No. 371,644

Claims priority, application Great Britain, June 21, 1972, 29007/72

Int. Cl. G06f *15/50*

U.S. Cl. 235—150.2 **28 Claims**

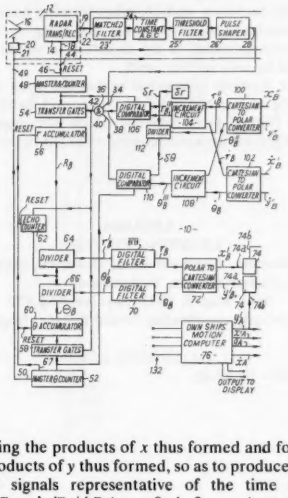
1. Computing apparatus for tracking moving objects, the apparatus comprising:

input circuit means for receiving temporally-spaced input positional signals each of which is indicative of a position of at least one moving object and may be subject to error; means for producing from said input signals a plurality of temporally-spaced pairs of digital positional signals *x*, *y*, each of which pairs of signals is representative in carte-

sian co-ordinate form of a position of said at least one object;

digital signal storage means connected to receive said pairs of signals and arranged to store a predetermined number of the most recently produced thereof;

digital filter means arranged to receive the stored signals, said digital filter means including digital multiplier means for multiplying each of said stored signals x by a respective one of a first set of predetermined coefficients and each of said stored signals y by a respective one of a second set of predetermined coefficients, and means for



summing the products of x thus formed and for summing the products of y thus formed, so as to produce respective digital signals representative of the time derivatives $d^m x/dt^m$ and $d^m y/dt^m$ ($m = 0, 1, 2, \ldots$) at at least one preselected common point in time on respective hypothetical functions $x = f_1(t)$ and $y = f_2(t)$ which substantially fit the values represented by x and y, both of said hypothetical functions being selected from the group of functions comprising polynomial functions of at least the second order and spline functions;

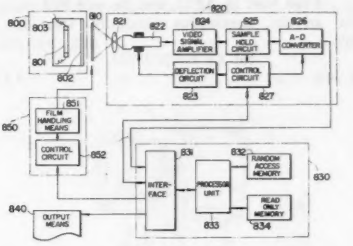
and means for producing output signals which are dependent upon said time derivative digital signals.

3,869,602
APPARATUS FOR AUTOMATIC COMPUTATION OF CARDIOTHORACIC RATIO

Nobuhiko Sezaki, and Kohji Ukena, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 29, 1972, Ser. No. 284,558
Claims priority, application Japan, Sept. 3, 1971, 46-68426
Int. Cl. G06f *15/42*
U.S. Cl. 235—151.3 **6 Claims**

1. A system for automatically measuring the cardiothoracic ratios comprising photo-electric conversion means (**820**) for effectively scanning a chest X-ray image (**810**) along a plurality of parallel lines perpendicular to the median line of said chest X-ray image and converting the brightness of said X-ray image into a corresponding electrical signal, data processing means (**830**) for processing data obtained from said photo-electric conversion means, and means (**840**) for recording or displaying the value of the cardiothoracic ratio obtained from said data processing means, said data processing means (**830**) inferring intersections between the boundary lines of the thorax and the heart and said plurality of parallel lines on the basis of data obtained along each of said parallel lines, said data processing means (**830**) correcting erroneous data which may be contained in four series of data corresponding to the boundary lines of the thorax and the heart, whereby the cardi-

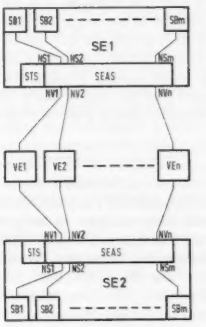


othoracic ratio is determined on the basis of said four series of data.

3,869,603
STORAGE UNIT TEST CONTROL DEVICE

Heinz Auspurg, Gauting; Josef Huber, Munchen; Jurgen Rabold, Munchen, and Gunther Wohlert, Munchen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 23, 1973, Ser. No. 381,613
Claims priority, application Germany, Aug. 28, 1972, 2242279
Int. Cl. G11c *29/00*
U.S. Cl. 235—153 AM **14 Claims**



1. A device for detecting faults in a storage unit of a program controlled data switching system comprising at least a processing unit and said storage unit, said device comprising:

a storage test control,

a communication input/output channel connecting said test control and said storage unit for transferring test information and control data between said test control and said storage unit,

a supplementary information channel connecting said processing unit to said test control for transferring said test information and said control data to said test control,

said storage test control including a control panel having a manual input portion for input of said control data and said test information, said panel and a two-position switch interposed in said supplementary information channel the first position providing for automatic input of said test information and said test data from said processing unit, the second position providing for manual input of said test information and said control data from said manual input portion of said control panel.

3,869,604

ELECTRONIC FLASH APPARATUS

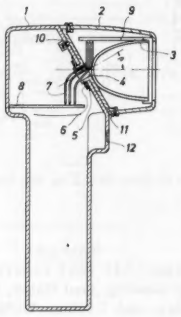
Claus Prochnow, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Nov. 26, 1973, Ser. No. 418,842

Claims priority, application Germany, Dec. 1, 1972, 2258895

Int. Cl. G03b *15/02*

U.S. Cl. 240—1.3 **4 Claims**



1. Electronic flash apparatus of the type having a sensor receiving light reflected from an object being photographed and controlling the duration of a flash in response to the light reaching the sensor along a sensor axis, said apparatus comprising a first housing part containing said sensor, a second housing part containing a flash reflector having an optical axis, and means for rotatably mounting said second housing part on said first housing part for rotation relative thereto about a rotary axis forming an acute angle of less than 45° to said sensor axis, said rotary axis being defined by a hollow tubular bearing membber, said apparatus further comprising an electrical conducting cable passing through said tubular bearing member to connect electric circuit parts within said second housing part to electric circuit parts within said first housing part.

3,869,605

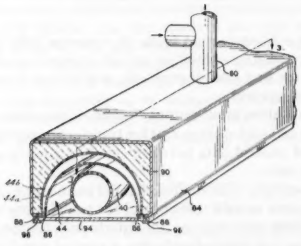
ENVIRONMENTAL GROWTH CONTROL APPARATUS

Noel Davis, Russell, Ohio, assignor to Integrated Development & Manufacturing Company, Chagrin Falls, Ohio

Filed June 24, 1970, Ser. No. 49,218

Int. Cl. F21v *29/00*

U.S. Cl. 240—47 **3 Claims**



1. A lamp assembly particularly suited for supplying high intensity illumination to growing plants in an environmental growth chamber comprising:

at least one high intensity electric discharge lamp;

a chamber forming means enclosing said lamp and including a first wall defining a surface extending substantially the length of said lamp, said surface being shaped and coated to reflect in a first direction light produced by said lamp in a wave length range of from approximately 400 to 700 nm, said surface further having the characteristic that light in a wave length range above approximately 700 nm is absorbed;

said chamber forming means further including a second wall defining with said first wall a closed fluid tight chamber, said closed chamber located directly behind said surface in relation to said lamp;

means for circulating a heat exchange fluid through said chamber;

heat insulation means surrounding said chamber on the said opposite said lamp;

a housing enclosing said chamber forming means and said heat insulation means, said housing being open along one side corresponding to the direction in which light is reflected by said surface; and,

a barrier member connected across the open side of said housing and enclosing said lamp, said barrier member being formed from material which is transparent to at least light in the wave lengths reflected by said surface.

3,869,606

LIGHTING FIXTURE

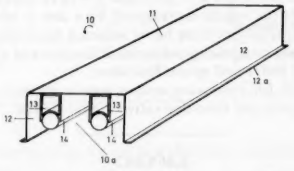
Marc Fordsmand, Charlottenlund, Denmark, assignor to Kicon AG, Ostermundigen, Switzerland

Filed May 9, 1973, Ser. No. 358,477

Claims priority, application Great Britain, May 24, 1972, 24357/72

Int. Cl. H05b *33/02*

U.S. Cl. 240—51.11 R **3 Claims**



1. A lighting fixture comprising an elongated, downwardly opening housing substantially rectangular in plan and having a top wall and a pair of side walls, a pair of tubular contact members mounted within the housing heat conductively associated with the top wall thereof and having concave part-cylindrical contact faces, a pair of fluorescent tubes mounted within the housing below the tubular contact members with the upper part of their cylindrical surface contacting the contact face of said tubular contact member, said fluorescent tubes being associated with electrical accessories including reactor coils, said accessories being mounted in the housing on the lower side of the top wall intermediate said tubular contact members, a pair of sockets resiliently mounted at either end of the housing for mounting the fluorescent tubes therebetween, said sockets comprising spring means for urging the fluorescent tubes upwardly against the contact faces of the tubular contact members, and means for circulating a coolant through said tubular contact members.

3,869,607

RADIOACTIVE MEANS FOR MEASURING DISTANCE INTERVALS BETWEEN ANOMALIES IN AN EARTH FORMATION

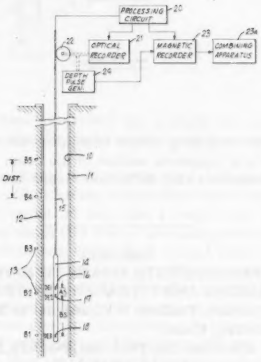
Gerard Sandier, Paris, and Jean-Paul Nels, Limours, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed July 13, 1973, Ser. No. 379,168

Claims priority, application France, July 13, 1972, 72.25508

Int. Cl. G01v 5/00

U.S. Cl. 250—266 21 Claims



1. In Earth formation measurements, a method of measuring the distance intervals between anomalies arranged in a sequence along a borehole traversing the formation, comprising the steps of:

a. providing a first, second and third anomaly detector and maintaining the first and second detectors at a defined relatively small spacing from each other and the third detector at a defined relatively great spacing from the first and the second detectors;

b. moving the detectors along the borehole to traverse said anomalies and to obtain a detection signal peak from each detector at the time it traverses an anomaly;

c. generating signals representing the time of occurrence of the detection signal peaks from the first and second detectors for the same anomaly and combining, by means of defined apparatus, the generated signals with a signal representing said small spacing between the first and second detectors to obtain a speed signal representing the speed of the detectors relative to the borehole between the occurrence of the two last recited detection signal peaks;

d. generating a signal representing the time of occurrence of the detection signal peak from the third detector for an anomaly adjacent to the anomaly for which the last recited signal peaks from the first and second detectors are obtained and combining, by means of a defined apparatus, the last recited time signal with at least a subset of the other recited signals, said subset including a signal representing at least one of said small and great spacing between the detectors, to obtain the distance interval between said adjacent anomalies; and

e. repeating steps (c), (d) and (e) for successive pairs of adjacent anomalies to obtain a plurality of distance intervals between anomalies.

3,869,608

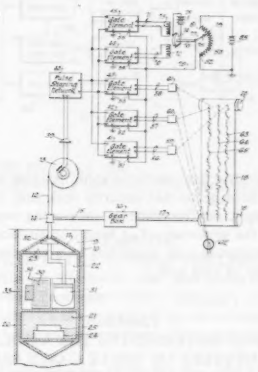
NUCLEAR WELL LOGGING

Serge A. Scherbatskoy, 3517 W. Ridge Ave., Fort Worth, Tex.

Continuation-in-part of Ser. No. 119,601, Oct. 5, 1949, Pat. No. 2,648,012. This application July 1, 1953, Ser. No. 365,499

Int. Cl. G01v 5/00

U.S. Cl. 250—270 23 Claims



1. A radioactivity well logging system for determining the oil-water interface in a fluid bearing formation traversed by a borehole, comprising a subsurface unit, means including a cable for lowering said unit into the borehole, a source of fast neutrons in said unit for bombarding with fast neutrons the formations traversed by the borehole as said unit is moved therewithin, fast neutron detector means in said unit for producing impulses corresponding to fast neutrons received from the formations the magnitude of which is related to the energy of the corresponding fast neutrons, a first pair of electrical selective networks for selecting only those impulses which fall within first and second narrow ranges of impulses height corresponding to predetermined related portions of the neutron cross section characteristic of the element carbon, a second pair of electrical selective networks for selecting only those impulses which fall within third and fourth narrow ranges of impulse heights, corresponding to predetermined related portions of the neutron cross section characteristic of the element oxygen, first ratio meter means for developing a first voltage proportional to the ratio of the outputs of said first pair of said selective electrical networks, second ratio meter means for developing a second voltage proportional to the ratio of the outputs of said second pair of said selective electrical networks, and means including third ratio meter means for producing an indication proportional to the ratio of said first and second voltages, whereby the oil-water interface in a fluid bearing formation may be detected.

3,869,609

TAMPER-PROOF SEAL SYSTEM

Pierre Simon Jehenson, Varese, Italy, and Gilbert Jean-Pierre Vos, Brussels, Belgium, assignors to European Atomic Energy Community (Euratom)

Filed Aug. 3, 1972, Ser. No. 277,606

Int. Cl. G01n 23/22

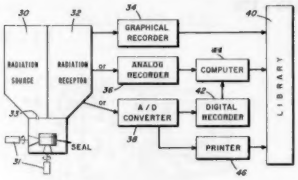
U.S. Cl. 250—272 2 Claims

1. A spectrographically identifiable security seal system, comprising:

at least one security seal comprising a base material containing particles of a plurality of different, spectrographically identifiable substances different from said base

materials randomly mixed and non-homogenously distributed within said base material,

said seal comprising a two-part capsule including internal retaining means for irreversibly closing said capsule,



and non-destructive spectrographic reading means for detecting damage to said security seal, said reading means including X-ray fluorescence measuring means for determining the spectrum of at least one surface of said seal, and comparing said spectrum to a previously recorded spectrum of said seal.

3,869,610

METHOD OF DETERMINING THE AMOUNT OF AN ISOTOPIC MIXTURE OF NOBLE GASES PRESENT AS A TAG IN A NUCLEAR REACTOR FUEL ELEMENT

Docile D. Durigon, North Huntington, and Richard C. Deklever, Monroeville, both of Pa., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 8, 1974, Ser. No. 431,820

Int. Cl. G21h *5/02*

U.S. Cl. 250—303 **2 Claims**

1. A method of determining that a fuel element for a nuclear reactor has present therein an effective amount of a mixture of different isotopes of the noble gases for detection of a fuel element failure comprising incorporating sufficient kypton–85 in the isotopic mixture before injecting the isotopic mixture into the plenum of the fuel element to provide between 1.0 and 5.0 microcuries of krypton–85 per inch of plenum in the fuel element, sealing the fuel element, gamma scanning the outside of the plenum to obtain an indication of the amount of krypton–85 present therein and comparing said indication with a similar gamma scan of an element of the same configuration known to have contained an effective amount of krypton–85.

3,869,611

PARTICLE-BEAM DEVICE OF THE RASTER TYPE

Friedrich Thon, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

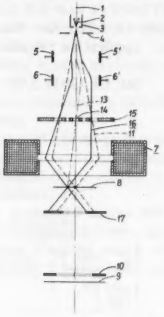
Filed Aug. 28, 1970, Ser. No. 67,922

Claims priority, application Germany, Sept. 19, 1969, 1948270

Int. Cl. H01j *37/26*

U.S. Cl. 250—311 **8 Claims**

1. A raster type charged particle-beam device having an electro-optical axis and defining a specimen locality on said axis, said device comprising beam generating means for issuing a beam of charged particles along said axis toward said specimen locality, a condensor lens for focussing said beam onto the specimen locality, said lens being disposed ahead of the specimen locality and coaxial with said axis, deflection means for deflecting the beam back and forth in raster fashion to raster scan a specimen placeable at the specimen locality, said deflection means arranged about said axis intermediate said beam generating means and said condensor lens, image receiving means disposed beyond the specimen locality in coaxial relation to said axis for receiving the rays of said beam passing through the specimen, and beam modifying means for modifying the imaging properties of the beam by cancelling a portion of the beam or modifying the phase of the rays



thereof, said modifying means being disposed in the path of said beam in a transverse section of the beam and being disposed intermediate said deflection means and the specimen locality.

3,869,612

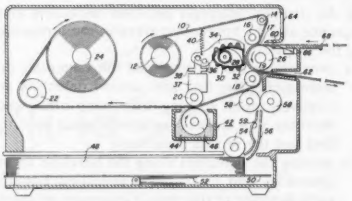
COPY APPARATUS WITH MEANS TO EFFECT VISIBLE RAY IMAGING AND INFRARED RAY TRANSFIXING

Myron J. Lenhard, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 28, 1973, Ser. No. 429,250

Int. Cl. G01n *21/34*

U.S. Cl. 250—319 **6 Claims**

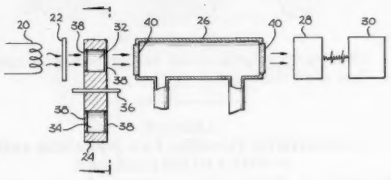


1. A copying apparatus comprising: a tungsten lamp for emanating energy at a high ratio of infrared to visible, a filter capable of allowing a substantial portion of visible rays emanated by said lamp to pass therethrough and for filtering a substantial amount of infrared rays to substantially reduce said energy ratio, means for energizing said lamp a first time when an original member having an image thereon to be copied and a heat sensitive member are at said station to form a heat image on said heat sensitive member, means for locating said filter in an operative position to be in the path of the rays emitted from said lamp when said lamp is energized said first time so that the heat sensitive member and said original member will be exposed to rays of said reduced energy ratio, means for energizing said lamp a second time when the heat sensitive member having a developed image thereon is at said ray path for heating the developed image, and means for withdrawing said filter from its operative position to allow said heat sensitive member to be exposed to visible energy and substantially more infrared energy when said lamp is energized the second time.

3,869,613
INFRARED GAS ANALYZERS

William T. Link, and Edward A. McClatchie, both of Berkeley, Calif., assignors to Akron Scientific Labs, Berkeley, Calif.

Continuation of Ser. No. 222,635, Feb. 1, 1972, abandoned. This application Sept. 27, 1973, Ser. No. 401,214
Int. Cl. G01n 21/26
U.S. Cl. 250—343 18 Claims



1. An infrared absorption gas analyzer for measuring the presence of a specific gas in an unknown gas sample comprising:

a source of infrared radiation directed along an optical path;

a rotating filter having at least first and second chambers disposed about an axis and a means for rotating said chambers about said axis so as to alternately dispose each of said chambers within said optical path, each of said chambers having at least partially infrared transparent windows therein, said first chamber containing a substantial amount of a first stable isotope of said specific gas and said second chamber containing a substantial amount of a second stable isotope of said specific gas which is less common than said first stable isotope so that the relative proportions of said first and second isotopes in said first and second chambers are substantially different, said first and second chambers being filled so to remove substantially equal amounts of infrared energy when disposed in said optical path;

means for disposing an unknown gas sample within said optical path and sensing means repetitively responsive to radiation passing through said first chamber and said gas sample to provide a first signal, and radiation passing through said second chamber and said gas sample to provide a second signal, said sensing means including a means for providing an output signal responsive to the difference in said first and second signals divided by one of said first and second signals;

said optical path being in fixed predetermined spatial relationship with respect to said source of infrared radiation, the axis of rotation of said rotating filter, said means for disposing an unknown gas sample within said optical path and said sensing means.

3,869,614
PHOSPHOR ASSEMBLY FOR ULTRAVIOLET LIGHT ABSORPTION DETECTOR

Miner N. Munk, Walnut Creek, Calif., assignor to Varian Associates, Palo Alto, Calif.

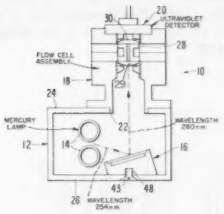
Filed Mar. 16, 1973, Ser. No. 342,263
Int. Cl. G01t 1/10
U.S. Cl. 250—365 7 Claims

1. In a method of making a sealed phosphor assembly, the steps comprising:

placing loose particulate phosphor in a cavity of a base in an amount sufficient to fill the cavity,

covering the cavity with a material substantially transparent to electromagnetic radiation of at least certain transparent to electromagnetic radiation of at least certain wave lengths,

heating the assembled base, phosphor and covering material



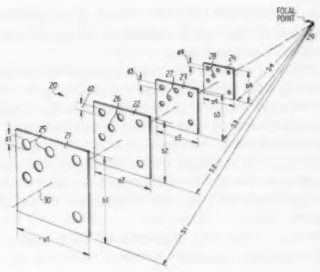
to dry the phosphor, and

sealing the covering material to the base about the cavity.

3,869,615
MULTIPLATE FOCUSING COLLIMATOR

Richard B. Hoover, Huntsville, Ala., and James H. Underwood, Palos Verdes Peninsula, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 28, 1973, Ser. No. 374,441
Int. Cl. G21f 5/00
U.S. Cl. 250—508 10 Claims



1. In an apparatus for scanning small near sources of penetrating radiation to obtain the energy distribution thereof, wherein a collimator assembly is interposed between a radiation source and a radiation detector, the improvement comprising:

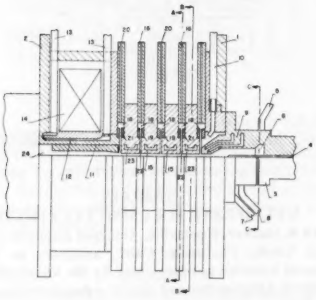
a collimator assembly having a plurality of similar plates aligned in parallel planes, said plates having a common axis through all their respective centers, said axis being normal to said parallel planes; each said plate having a plurality of apertures the same size, the plurality of apertures on each said plate having a similar random distribution; the relative size of said plates and the spacing between said respective plates being arranged to produce radiation channels which converge to a focal point through corresponding ones of the similar random distribution of apertures of the plates, the diameter of the apertures and the length of the sides of said respective plates being directly proportional to the distance from said respective plates to the said focal point, the radiation incident on the radiation detector being maximized when the said focal point and the radiation source coincide.

3,869,616

REACTOR FOR PLASMA-CHEMICAL PROCESSES

Erik Smars, Rimbo; Palne Mogensen, Jarfalla, and Mats J. Kaij, Solna, all of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Oct. 9, 1973, Ser. No. 404,658
Claims priority, application Sweden, Oct. 6, 1972, 12902/72
Int. Cl. C22d *7/08;* **C07c** *3/24;* **B01k** *1/00*
U.S. Cl. 250—547 **10 Claims**



1. A reactor for plasma-chemical process comprising;

a pair of electrodes for the disposition of an arc therebetween;

means for the injection of a plasma gas tangentially to said arc so that said arc is stabilized along a center line connecting said electrodes;

a plurality of annular segments comprising electrically conducting heat resistant material defining an arc path between said electrodes, thereby forming a tubular envelope surrounding said stabilized arc therebetween; and

a plurality of annular discs of electrically insulating material disposed alternatingly with said annular segments.

5. A reactor for plasma-chemical processes comprising;

a pair of electrodes for the disposition of an arc therebetween;

a plurality of annular segments of electrically conductive heat resistant material between said pair of electrodes; and

a plurality of annular discs of insulating material disposed alternatingly with said annular segments, so that a stabilized arc may be maintained along said arc path between said electrodes.

3,869,617

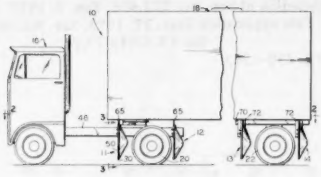
SPRAY SUPPRESSING DEVICE FOR A HIGHWAY VEHICLE

Julius Gaussoin, Vancouver, Wash.; Robert B. Nottingham, Lake Oswego, and Robert E. Reichard, Gresham, both of Oreg., assignors to Silver Eagle Manufacturing Co., Inc., Portland, Oreg.

Filed Sept. 4, 1973, Ser. No. 394,147
Int. Cl. B02d *35/00*
U.S. Cl. 290—1 S **9 Claims**

1. In a spray suppressing device for a highway vehicle having a tired wheel comprising air flow directing means mounted on the vehicle in a position adapted to flow air inwardly from the zone outside the wheel past the exposed peripheral portions of the tired wheel to prevent water thrown by the wheel from travelling outwardly relative to the vehicle,

the flow directing means including a sheet-like deflector positioned in front of the tired wheel and extending rearwardly and inwardly relative to the vehicle for directing



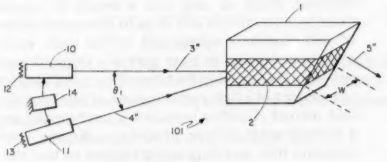
air inwardly relative to the vehicle and converging the flow of air therepast.

3,869,618

HIGH-POWER TUNABLE FAR-INFRARED AND SUBMILLIMETER SOURCE

Benjamin Lax, Chestnut Hill, and Roshan L. Aggarwal, Burlington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 30, 1972, Ser. No. 302,322
Int. Cl. H03f *7/04*
U.S. Cl. 307—88.3 **17 Claims**



1. A method of generating tunable difference-frequency radiation in the far-infrared and submillimeter regions of the electromagnetic spectrum, that comprises: generating first and second laser beams of high intensity and large size, both of said beams being in the near-infrared region of the electromagnetic spectrum or both of said beams being in the visible region of the electromagnetic spectrum; adjusting the frequency of at least one of the two laser beams so that the difference between the frequencies of the two beams is equal to said difference frequency; directing the two laser beams upon a non-linear crystal in a non-collinear configuration to generate the difference-frequency radiation as an output from the crystal; directing the first beam upon the non-linear crystal so as to excite a substantial volume of the crystal, said crystal having a large non-linear coefficient and small absorption coefficient at the frequencies of the two laser beams as well as at said difference frequency; directing the second beam at an angle to the first beam and to at least a substantial part of the same portion of the crystal excited by the first beam, the beams being mixed in the crystal to provide said difference frequency; and adjusting the angle between the first and second beams to achieve the phase matching necessary for efficient generation of said difference-frequency.

3,869,619

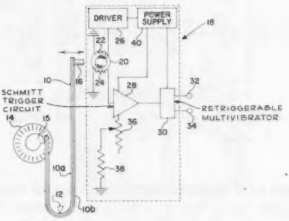
CONTACTLESS ELECTRICAL THERMOSTAT EMPLOYING A BIMETALLIC STRIP

Charles Carl Camillo, Western Springs, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Nov. 16, 1973, Ser. No. 416,490
Int. Cl. H01h *35/00*
U.S. Cl. 307—117 **12 Claims**

1. An electrical thermostat comprising a saturable magnetic element, a bimetallic strip movable with respect to said mag-

netic element in response to environmental temperature, a permanent magnet affixed to said bimetallic strip which is movable to a first position in close magnetic coupling with said magnetic element so that said magnetic element will be relatively magnetically saturated when the environmental temperature is at a first value and is movable to a second position wherein said magnetic element will be relatively magnetically



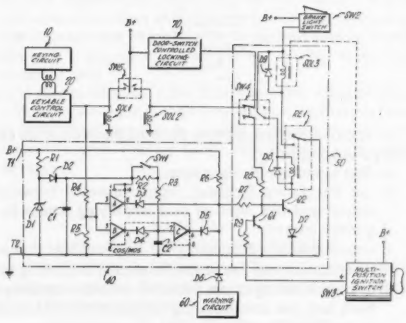
unsaturated and the environmental temperature is at a second value, a primary winding and a secondary winding associated with said magnetic element, means for supplying electrical time-varying signals to said primary winding and output means coupled to said secondary winding for receiving time-varying output voltage signals the magnitude of which varies inversely with the degree of magnetic saturation of said magnetic element.

3,869,620

POWER CONTROL CIRCUIT FOR AUTOMOTIVE VEHICLES AND THE LIKE

Francis A. McGuirk, Jr., Chatham, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Division of Ser. No. 289,283, Sept. 15, 1972, Pat. No. 3,824,403. This application Sept. 10, 1973, Ser. No. 395,739
Int. Cl. H01h *7/00*
U.S. Cl. 307—141 **5 Claims**



1. A power control circuit comprising:

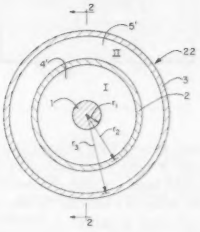
1. timing circuit means operative to receive an input signal and to generate an enabling signal for a predetermined period of time from the termination of said input signal; and
2. enabling circuit means operative to receive said enabling signal and an energizing signal, and operative in response to the coincidence of said enabling and energizing signals to generate an output signal.

3,869,621

GRADED CONTAINED BULK TRANSMISSION SYSTEM

Gerald L. Wilson, Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 17, 1973, Ser. No. 389,075
Int. Cl. H01b *11/02*
U.S. Cl. 307—147 **7 Claims**



1. A transmission system adapted to transmit power at extra-high to ultra-high voltages, that comprises: a plurality of concentric, circular, conducting cylinders, the center cylinder of the plurality being adapted to connect to a source of high transmission level voltage, to carry current and thus transmit electric power in the axial direction, and an intermediate cylinder disposed radially outward from the center cylinder and adapted to connect to a source of voltage whose voltage level is less than that connected to the center conductor, a gaseous dielectric medium under pressure occupying the region between the two cylinders, the radius r_1 of the center cylinder and the radius r_2 of said further cylinder being found from the following two expressions:

$$V_{I_{crit\ optimum}} = \frac{\delta\left(A + \frac{B}{(\delta r_1)^{1/2}}\right)^2 r_1}{A + \frac{B}{2(\delta r_1)^{1/2}}}$$

$$r_2 = r_1\, e^{\left(\frac{A + \frac{B}{(\delta r_1)^{1/2}}}{A + \frac{B}{2(\delta r_1)^{1/2}}}\right)}$$

where $V_{I_{crit\ optimum}}$ is the optimum allowable voltage that can exist across the region between the two cylinders without breakdown. A and B are constants determined by the dielectric medium in said region and δ is a factor determined by the pressure of the gas in the region between the cylinders.

3,869,622
LOGIC GATE CIRCUIT INCLUDING A SCHOTTKY BARRIER DIODE

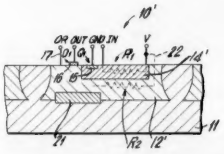
Kyozo Shimizu, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 8, 1972, Ser. No. 287,447

Claims priority, application Japan, Sept. 10, 1971, 46-69703

Int. Cl. H01l *19/00*

U.S. Cl. 307—213 **3 Claims**



1. A logic circuit having first and second logic circuits both formed in a single P-type semiconductor substrate; each of said first and second logic circuits comprising an NPN transistor, a plurality of Schottky barrier diodes each connected to said transistor collector terminal, a first impedance element, an input terminal connected to said transistor base, and a plurality of output terminals, an N-type collector region of said NPN transistor being formed in the upper surface of said substrate, an elongated P-type base region of said NPN transistor being formed in said collector region, an N-type emitter region of said NPN transistor being formed at one end of said elongated base region therein, each of said plurality of said Schottky barrier diodes including a metal electrode attached to the surface of said collector region near said one end of said base region, said impedance element being defined by the part of said elongated base region lying between said emitter region and the other end of said elongated base region, said input terminal including an ohmic contact attached to said one end of said elongated base region, a plurality of said output terminals being connected to said respective metal electrodes, and a voltage source connected between said other end of said elongated base region and said emitter region, one of a plurality of said output terminals of said first logic circuit being connected to said input terminal of said second logic circuit.

3,869,623
ELECTRONIC SEQUENCE SWITCH WITH HOLDING CIRCUIT

Willy Minner, Schwaigern, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

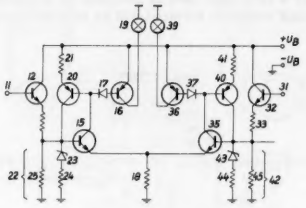
Filed Apr. 20, 1973, Ser. No. 353,113

Claims priority, application Germany, Apr. 29, 1972, 2221331

Int. Cl. H03k *17/00*

U.S. Cl. 307—241 **4 Claims**

1. In a sequence switch circuit composed of a plurality of sequence switch members each including a signal input, a switching unit switchable between a switched-on state and a switched-off state, and a holding circuit connected to said unit, said input, unit and holding circuit of each said member being connected for causing a signal at said input of one said member to switch said switching unit of said one member to its switched-on state and to initiate flow of a holding current in said holding circuit of said one member to hold said associated unit in its switched-on state, and for causing such holding current to continue to flow until a signal is applied to said input of another one of said members to cause: said switching unit of said one member to be switched to its switched-off state; said switching unit of said other member to be switched to its switched-on state; and a holding current to flow in said holding circuit of said other member, the improvement comprising: a non-linear current/voltage element connected to said holding circuit in such a manner that holding current



flows through said element and maintains said element at an operating point such that it is driven with small differential resistance and that it represents a relatively low electrical resistance for a disturbance pulse.

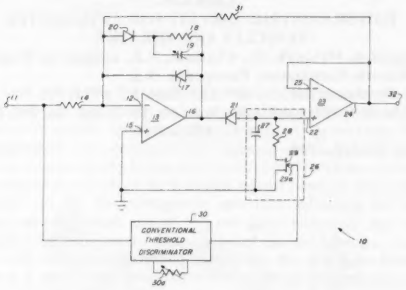
3,869,624
PEAK HOLDING CIRCUIT FOR EXTREMELY NARROW PULSES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Robert W. O'Neill, Houston, Tex.

Filed May 21, 1973, Ser. No. 362,146

Int. Cl. H03k *5/04*

U.S. Cl. 307—267 **8 Claims**



1. A circuit for lengthening the time duration of an electrical pulse comprising:

a. first input amplifying means;

b. an integrating feedback loop connected between the output and one input of said amplifying means for frequency control;

c. coupling means connecting the output of said first amplifying means with one input of a second amplifying means;

d. compensating means included in said integrating feedback loop for compensating for nonlinear characteristics in said coupling means;

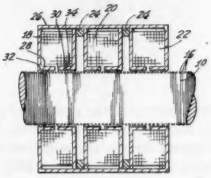
e. pulse width control means having an input supplied with said electrical pulse and an output applied to said second amplifying means for regulating the width of pulses output from said second amplifying means; and

f. threshold discriminating means included in said pulse width control means for determining the presence of an electrical pulse having predetermined electrical characteristics at the input to said first amplifying means whereby only pulses having such predetermined characteristics have their widths regulated by said control means.

3,869,625
PLURAL AXIS LINEAR POSITION

Bruce A. Sawyer, 39 Inverness Rd., Thousand Oaks, Calif. 91360

Continuation-in-part of Ser. No. 178,637, Sept. 8, 1971, abandoned. This application May 21, 1973, Ser. No. 362,119
Int. Cl. H02k *41/02*
U.S. Cl. 310—12 **18 Claims**



1. A positioning system for providing a controlled relative movement between two members along at least a first longitudinal axis and a second cylindrical axis angularly displaced relative to the first longitudinal axis, including

a first member forming a cylindrical platen having at least a first plurality of first and second portions alternately disposed relative to one another and extending in a first direction having a major component in the longitudinal direction and displaced relative to one another in a second direction having a major component in the angular direction,

a second member disposed adjacent to the first member along the surface of the first plurality of first and second portions of the cylindrical platen for movement relative to the first member in the second direction,

first means cooperative with the first portions in the first plurality for producing a force between the second member and the first portions on the first member to provide a displacement of the second member relative to the first member in the second direction, and

a second plurality of first and second portions included in the first member and intersecting the first plurality of first and second portions and alternately disposed relative to one another and extending in the second direction and disposed in spaced relationship to one another in the first direction, and

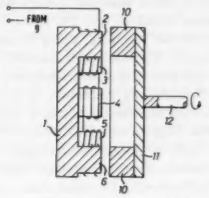
second means included in the second member for producing a force between the second member and the first portions in the second plurality to provide a displacement of the second member relative to the first member in the first direction.

3,869,626
DYNAMO ELECTRIC MACHINES

Michael Charles Puttock, Sunbury, and Bryan Crosby Linfoot, Amersham, both of England, assignors to EMI Limited, Hayes, Middlesex, England

Filed Sept. 27, 1971, Ser. No. 184,120
Int. Cl. H02k *21/12*
U.S. Cl. 310—152 **6 Claims**

1. A dynamo electric machine comprising a rotor member including an annulus of magnetically hard ferrite material with a plurality of magnetic domains arranged in a ring on one face thereof, adjacent domains being magnetised in different senses; and a stator member spaced from said rotor member and formed of magnetically soft material, said stator including a plurality of substantially cylindrical magnetically soft ferrite poles protruding therefrom arranged in a circle concentric with said annulus and having substantially circular faces directed towards said domains for establishing magnetic flux linkage therewith, each of said poles being encompassed by a

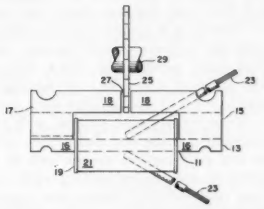


plurality of closed loop windings of electrically conductive material.

3,869,627
SYNCHRONOUS MOTOR

Michael J. Ingenito, New York, N.Y., and Paul J. Corser, Charlotte, N.C., assignors to General Time Corporation, Thomaston, Conn.

Continuation-in-part of Ser. No. 227,072, Feb. 17, 1972, Pat. No. 3,803,433. This application June 27, 1973, Ser. No. 374,022
Int. Cl. H02k *21/08*
U.S. Cl. 310—162 **11 Claims**



1. A synchronous motor comprising:

a disc shaped motor having an annular ring of permanently magnetized poles extending through the thickness and about the periphery thereof, each of said poles having a pole of opposite polarity positioned contiguously on each side thereof;

a stator including a core and an energizing winding, said core having at least one pole pair which defines an axial air gap through which passes the permanently magnetized annular portion of said rotor, said energizing winding being coupled to said stator core for providing an energizing flux field in said core, said flux field passing between said stator poles through said rotor substantially perpendicular to the plane of said rotor, the magnetic field generated by said rotor poles passing through said stator substantially perpendicular to the surface of said stator pole pair; and

supplemental flux conducting means carried by said stator, said supplemental flux conducting means including a protrusion extending therefrom in a plane parallel to the plane of said rotor and located adjacent said rotor periphery for enhancing flux flow between rotor and stator during operation.

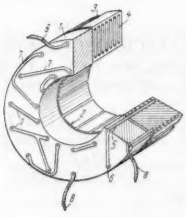
3,869,628
ELECTRIC MACHINE STATOR

Andrei Vladimirovich Koritsky, Lefortovsky val, 7/6, kv. 1; Viktor Alexandrovich Ignatov, Novorossiiskaya ulitsa, 12, kv. 19; Leonid Moiseevich Polyak, ulitsa Podbelskogo, 28, korpus 2, kv. 8, all of Moscow; Semen Abramovich Shapiro, Pervomaiskaya ulitsa 6, kv. 19, Istra Moskovskoi oblasti; Grigory Aronovich Bokman, ulitsa Dybenko, 32, korpus 3, kv. 267, Moscow; Vladimir Alexandrovich Mordvinov, ulitsa Vlasova, 7, korpus 2, kv. 43, Moscow; Mikhail Ivanovich Zhizhin, B-Demidovsky pereulok, 4, kv. 2, Moscow; Alexandr Davydovich Slonimsky, ulitsa 9 Gvardeiskoi divizii, 60 kv. 23; Kimik Tigranovich Sevinian, Pervomaiskaya ulitsa, 12, kv. 6, both of Istra Moskovskoi oblasti; Semen Izrailovich Adaskin, Petrozavodskaya ulitsa, 30, kv. 89, and Vladimir Vladimirovich German, Stavropolskaya ulitsa, 32, kv. 12, both of Moscow, all of U.S.S.R.

Filed Dec. 6, 1973, Ser. No. 422,205

Int. Cl. H02k *1/12*

U.S. Cl. 310—179 **8 Claims**



1. An electric machine stator comprising: a ferromagnetic carrier of a predetermined shape; a plurality of uniform ferromagnetic teeth affixed to one surface of said ferromagnetic carrier, spaced from one another, and lying in a predetermined pattern; a plurality of printed circuit conductors on first and second opposite surfaces of each of said uniform teeth, said conductors being substantially linear and substantially parallel to one another; a plurality of metallic conductive paths embedded in each of said uniform teeth extending from said first to said second opposite surface, with each conductive path electrically uniting one end of one printed circuit conductor on said first surface to one end of one printed circuit conductor on said second surface, said printed circuit conductors and said metallic conductive paths defining a continuous winding extending from one surface of each of said uniform teeth to an opposite surface thereof; first and second metallic terminals in each of said uniform teeth, connected to respective ends of the continuous winding, and extending out of one surface; connector means through which the respective terminals of each of said teeth extend; and printed circuit conductors on the surface of said connector means opposite from said uniform teeth, for connecting the respective terminals of said uniform teeth in a predetermined electrical pattern.

3,869,629
STATOR IN SMALL ELECTRIC MACHINE

Takashi Ogawa; Kiyonori Kida, and Shunichi Sugiyama, all of Kawasaki, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Kanagawa-ken, Japan

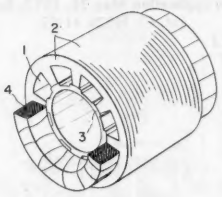
Filed Sept. 26, 1973, Ser. No. 400,812

Claims priority, application Japan, Sept. 27, 1972, 47-96893

Int. Cl. H02k *1/16*

U.S. Cl. 310—216 **3 Claims**

1. A stator in a small electric machine which comprises a substantially cylindrical stator core having a plurality of tooth-like poles which radially extend from the inner surface thereof and which define a plurality of winding accomodating slots therebetween; windings inserted in said winding accomodating slots; and a substantially cylindrical inner sleeve which includes a plurality of protruded portions each of which respectively contact a tooth-like pole of said stator core and



bridging portions which join the protruded portions, the protruding portions and the bridging portions forming recessed portions in said inner sleeve, the width of each of said protruded portions being greater than the width of its corresponding tooth-like pole.

3,869,630
DISCHARGE LUMINESCENCE ELEMENT ARRAY HAVING A GAS FLOW PATH

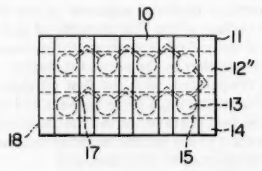
Kenji Maio, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 9, 1973, Ser. No. 339,916

Claims priority, application Japan, Mar. 13, 1972, 47-25638

Int. Cl. H01j *1/78, 11/02*

U.S. Cl. 313—188 **12 Claims**



1. In a discharge luminescence element array comprising a pair of parallel insulator plates, electrodes provided on the outer faces of said pair of insulator plates, and a separator interposed between said pair of insulator plates, said separator having a plurality of apertures formed therein defining the same plurality of discharge spaces with said pair of insulator plates, the improvement comprising a groove-like gas flow path provided at the interface between one of said pair of insulator plates and said separator for evacuating gas from and providing a discharge gas to said discharge spaces, said separator being sealed at its entire main faces to said pair of insulator plates.

3,869,631
DIODE-CONTAINING INCANDESCENT LAMP HAVING IMPROVED EFFICIENCY

Warren A. Anderson, Danvers; Edmund M. Passmore, Wilmington, both of Mass., and Wilfrid G. Matheson, San Diego, Calif., assignors to GTE Sylvania Incorporated, Danvers, Mass.

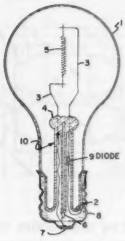
Continuation-in-part of Ser. No. 335,922, Feb. 26, 1973, abandoned. This application May 31, 1974, Ser. No. 474,991

Int. Cl. H01k *1/62*

U.S. Cl. 313—217 **1 Claim**

1. An incandescent lamp comprising: a gas filled glass envelope sealed at its lower end to the flare of a stem press glass mount; a screw base having a center contact attached to the lower end of said envelope; two lead-in wires extending

through the stem press of said mount, one of said lead-in wires being electrically connected to said center contact and the other being electrically connected to the rim of said screw base; a diode electrically connected between one of said lead-



in wires and said base; and a coiled tungsten wire filament disposed within said envelope and connected between said two lead-in wires, the relationship between the diode and the filament being such that the filament temperature during normal lamp operation is at least 2,600° Kelvin.

3,869,632

GLOW CATHODE

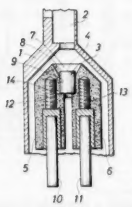
Friedhelm Schulz, Liedolsheim, Germany, assignor to Gesellschaft Fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Aug. 24, 1973, Ser. No. 391,056

Claims priority, application Germany, Sept. 1, 1972, 2242986

Int. Cl. H01j *1/14, 19/06*

U.S. Cl. 313—346 **12 Claims**



1. Glow cathode comprising:

a. an electron emitter of button shape, made of a metal or metal carbide having a high melting point;

b. an electrically conductive mounting made of a highly refractory, substantially infusible material having a high electron work function, said electron emitter being held by said mounting; and

c. lead wire means in contact with said mounting and out of contact with said electron emitter for passing an electric current through said electron emitter for heating the same.

3,869,633

ELECTRON TUBE SOCKET

Christ J. Dumas, Forest View, and Stephen S. Simovits, Jr., Downers Grove, both of Ill., assignors to American Plasticraft Company, Chicago, Ill.

Filed Oct. 15, 1973, Ser. No. 406,584

Int. Cl. H01j *17/00, 21/00*

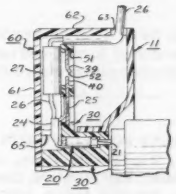
U.S. Cl. 313—325 **10 Claims**

1. A tube socket assembly for dissipating transient surges of high voltage occurring at the terminal pins of an electron tube comprising

enclosure means to form an electrically insulated internal chamber,

terminal receiving means for electrical coupling to the terminal pins of an electron tube carried by said enclosure means,

spark gap defining means within said enclosure means electrically coupled to said terminal receiving means comprising a first electrode having the terminal pin voltage imposed thereon and an adjacent grounded electrode separated by a dielectric material, said first electrode and said grounded electrode having adjacent portions abraded to remove non-meniscus discontinuities formed during fabrication of said electrodes to precisely control arc-over initiation voltage and to prevent corona formation at points of lower impedance,



a high-voltage chamber segregated from the remaining portion of said dielectric body portion by means of a barrier wall and having a controlled uniformly spaced spark gap for stabilizing a high-voltage lead during surges of electrical energy,

said spark gaps are positioned within openings defined by said dielectric body portion such that the arc energy is uniformly stressed in the area of the spark gap,

said dielectric material separating said electrodes provides a variable impedance therebetween,

said electrodes separated by a dielectric material include first means across which an arc is initiated and second means for dissipating the arc energy, and

electrical leads electrically coupled to said terminal receiving means and said gap defining means.

3,869,634

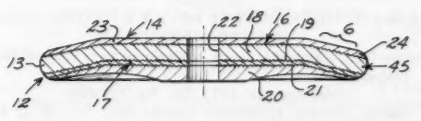
ROTATING X-RAY TARGET WITH TOOTHED INTERFACE

Ronald D. Konieczynski, Royalton, Ohio, and Allan H. Springmeyer, Newtown, Conn., assignors to General Electric Company, Milwaukee, Wis.

Filed May 11, 1973, Ser. No. 359,459

Int. Cl. H01j *35/10*

U.S. Cl. 313—330 **10 Claims**



1. An x-ray tube rotary target comprising, in combination, a refractory metal target face; and

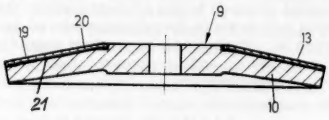
a refractory material body joined to the target face by powdered metallurgy technique along an interface to form a unitary structure;

the interface including a multiplicity of mating hills and valleys in a predetermined pattern in the body and the target face.

3,869,635
ROTARY ANODE FOR AN X-RAY TUBE

Rudolf Friedel, Erlangen, Germany, and Karl Sedlatschek, Reutte, Austria, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed June 12, 1973, Ser. No. 369,393
Claims priority, application Germany, June 28, 1972, 2231686
Int. Cl. H01j *35/08*
U.S. Cl. 313—330 **3 Claims**

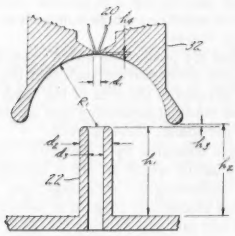


1. A rotary anode for an X-ray tube having a surface struck by electrons and producing X-rays, said surface consisting of 95 percent molybdenum and 5 percent hafnium.

3,869,636
FILAMENT FOR ELECTRON GUNS

Glen S. Lawrence, Windsorville, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 250,910, May 8, 1972, abandoned. This application May 31, 1973, Ser. No. 365,799
Int. Cl. H01j *1/15, 19/08*
U.S. Cl. 313—341 **8 Claims**



1. An improved long-life filament for a high power electron beam machine comprising

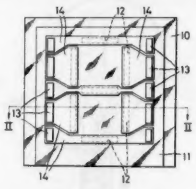
a continuous thin ribbon of tungsten rhenium alloy containing about 3% rhenium by weight and formed to have a flat emitting face with the portion of said ribbon on opposite sides of said emitting face being bent to form first and second leg portions extending from and continuous with said emitting face.

3,869,637
ALPHA-NUMERIC DISPLAY DEVICE UTILIZING LIGHT EMITTING DIODES

Setsuo Usui, Chigasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1973, Ser. No. 354,068
Claims priority, application Japan, Apr. 28, 1972, 47-42885; Apr. 28, 1972, 47-42886
Int. Cl. H01j *1/54*
U.S. Cl. 313—500 **8 Claims**

1. An alpha-numeric character display device comprising, a planar transparent plate, a first opaque planar layer attached to said transparent plate and formed with windows arranged to form a plurality of display units with each unit having a number of windows arranged to selectively indicate a number of desired numbers or characters, a plurality of light emitting diodes mounted on said first opaque layer outside of said display units and mounted so as not to overlie said windows and at least one diode associated with each of said windows, a plurality of light transmitting planar layers formed over said first opaque layer and each covering one of said windows and extending to the diode associated with each of said windows

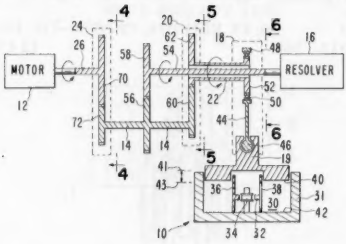


such that light emitted by said diodes will pass parallel to said planar transparent plate, a second opaque layer covering said light transmitting planar layers such that light emitted from said diodes will be emitted from said windows, and electrical energizing means connected to said diodes to selectively energize them to produce a desired indication.

3,869,638
TRIANGULAR DITHER-TUNED MICROWAVE TUBE

William Allen Gerard, Andover, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed Nov. 2, 1973, Ser. No. 412,526
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.61 **12 Claims**



1. In combination with a tunable frequency microwave tube apparatus having microwave circuit means, tuning means movable within the region of said circuit means for tuning said microwave circuit means, and thus the operating frequency of the tube; an input shaft; means for cyclically moving said tuning means between two extremes of travel in response to rotation of said input shaft dither the operating frequency; the improvement comprising first gear train means driving said input shaft from a drive shaft and producing with respect to rotation of said drive shaft a cyclical rotation rate of said input shaft such that maximum rotation rate occurs at said two extremes of travel of said tuning means and such that the operating frequency of said tube has a triangular dither characteristic with respect to time.

3,869,639
EMERGENCY LIGHTING SYSTEM USING DIM TO BRIGHT FLASHING OPERATION

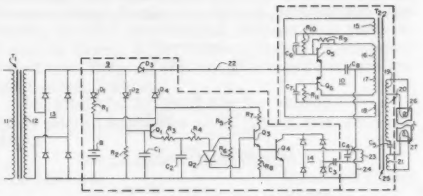
Rollie R. Herzog, Danville, Ill., assignor to General Electric Company, Indianapolis, Ind.

Filed Aug. 24, 1973, Ser. No. 391,076
Int. Cl. H05b *37/00*
U.S. Cl. 315—86 **7 Claims**

1. A circuit for operating at least one gaseous discharge lamp during both normal and emergency conditions comprising:

input means for connecting the circuit to a first source of power providing operating voltage during normal conditions when the first power source is operative;

a first oscillator connected to said input means for applying voltage to the lamp at a predetermined frequency thereby to yield a single light level;



means for automatically connecting a second source of power to said first oscillator when the first power source is inoperative for providing operating voltage for said first oscillator during emergency conditions; and

means for cyclically varying the frequency of said first oscillator in a predetermined range during emergency conditions such that the light level of the lamp varies cyclically.

3,869,640

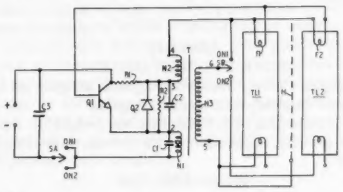
POWER SUPPLY ARRANGEMENT FOR FLUORESCENT TUBES, THERMIONIC DEVICES AND THE LIKE

Taras Avenir Kolomyjec, 15 Camelot Ct., Carlingford, N. S. W., Australia

Filed July 9, 1973, Ser. No. 377,835

Int. Cl. H03k *3/28*; **H05b** *41/29*

U.S. Cl. 315—97 **10 Claims**



1. A fluorescent lamp arrangment comprising a blocking oscillator transistor inverter having a primary winding, a feedback winding, and a secondary winding, there being a substantial step up ratio between primary and secondary windings, two fluorescent tubes, means connecting a filament of at least one tube in series with the feedback winding whereby the filament is preheated by the collector current of the transistor, a conductive connection between the preheated filament of the said one tube and one filament of the second tube, a connection between one end of the secondary winding and the other filament of said one tube, and a switch connected to the other end of the secondary winding, said switch in one position connecting the said other end to the said preheated filament of said one tube and in another position connecting the said other end of the secondary winding to the other filament of said second tube, whereby

1. when one tube only is to be energized the secondary winding is connected across the said preheated filament and the other filament of that tube, and
2. when both tubes are to be energized the ends of the secondary winding are connected one to the non-preheated filament of the said one tube, and the other end of the winding to the other filament of the second tube, there being a series path for the lighting current through both tubes.

3,869,641

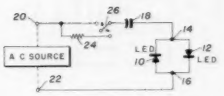
AC RESPONSIVE LED PILOT LIGHT CIRCUITRY

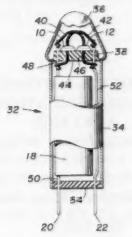
Jack Goldberg, Marshalltown, Iowa, assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 265,079, June 21, 1972, abandoned. This application Oct. 24, 1973, Ser. No. 409,116

Int. Cl. H03k *3/42*

U.S. Cl. 315—135 **4 Claims**





1. An LED pilot light operable from a source of AC line voltage, comprising a pair of light-emitting diodes, said diodes being connected in parallel with opposite polarity, each of said diodes generating light when properly forward biased, an enclosure having a light transmissive portion, means for supporting both of said diodes in said enclosure such that light emitted by said diodes radiates from said enclosure through said light transmissive portion in a single direction, and a capacitor having one side interconnected with said pair of diodes at one junction common to said diodes, a first circuit input terminal interconnected with the other side of said capacitor, a second circuit input terminal interconnected with the other junction common to said diodes, the capacitor voltage following AC line voltage applied to said input terminals and limiting the voltage drop across said diodes as said diodes alternately conduct on respective half cycles of said AC line voltage.

3,869,642

CONTROL CIRCUIT FOR ELECTRONIC FLASH APPARATUS

Mehmet Sabanci, Braunschweig, Germany, assignor to Rollei-Werke Frahke & Heidecke, Braunschweig, Germany

Filed Mar. 27, 1974, Ser. No. 455,134

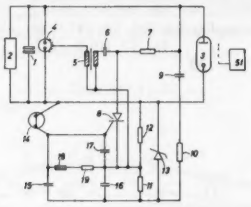
Claims priority, application Germany, Apr. 4, 1973, 2316724

Int. Cl. H05b *37/02*

U.S. Cl. 315—151 **5 Claims**

1. Electronic flash apparatus for photographic illumination comprising flash producing means, flash terminating means including a thyristor effective, upon actuation, to terminate a flash produced by said producing means, said thyristor having a control grid, flash measuring means for measuring an integrated amount of light reflected from an object being photographed, and control circuit means responsive to said measuring means for actuating said thyristor to teminate said flash when the integrated amount of light measured by said measuring means reaches a threshold value, said control circuit means including a capacitor (17) connected to said control

grid, and an inductance (**18**) and a resistor (**19**) connected in series with each other and in parallel with said capacitor (**17**), said capacitor, inductance, and resistance being so dimensioned that the time constant resulting from the dimensions of said capacitor and resistor is substantially equal to the time constant resulting from the dimensions of said inductance and resistor.

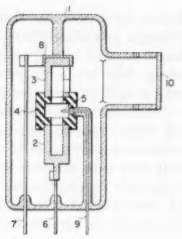


3,869,643

APPARATUS FOR EMITTING ATOMIC FLOURESCENCE SPECTRAL LINES USED FOR ATOMIC ABSORPTION ANALYSIS

Hiroshi Okagaki, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 4, 1974, Ser. No. 430,943
Claims priority, application Japan, Jan. 12, 1973, 48-6440
Int. Cl. H01j *61/04*
U.S. Cl. 315—167 **16 Claims**



1. An apparatus for emitting atomic fluorescence spectral lines used for atomic absorption analysis comprising an envelope, first means for emitting spectral lines of atoms in a first position within said envelope, second means for generating vapor of atoms at ground state in a second position within said envelope, said second position lying on the optical axis providing the path for said spectral lines of atoms, and third means for directing atomic fluorescence spectral lines obtained by irrediation of said atomic vapor with said spectral lines of atoms in a direction different from the direction of said optical axis thereby deriving a said fluorescence spectral lines from said envelope.

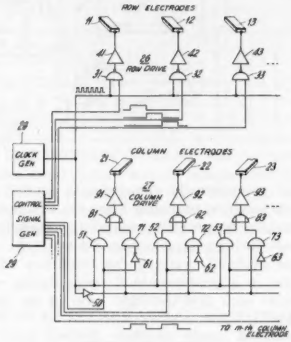
3,869,644

PULSES OF THE SAME OR AN OPPOSITE POLARITY TO ELECTRODES OF A PLASMA DISPLAY PANEL

Akira Yano; Norio Sato, and Tunekiyo Iwakawa, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Aug. 16, 1973, Ser. No. 388,787
Claims priority, application Japan, Aug. 22, 1972, 47-84285
Int. Cl. H05b *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **3 Claims**

1. A circuit for driving an external electrode discharge display panel having a plurality of gas discharge cells, a first and a second group of electrodes disposed on opposite sides of said cells, and means for cyclically supplying a first pulse train of a predetermined duration to the electrodes of said first group, wherein the improvement comprises means for supplying a second pulse train to each electrode of said second group, said second pulse train supplying means comprising means for supplying pulses of a polarity opposite to the pulses of said first pulse train and substantially coincident with said first pulse train when the display discharge cell associated with the first and second group electrodes respectively receiving said first and second pulse trains is to glow, and means for otherwise supplying pulses of the same polarity as the pulses of said first pulse train wherein said first and second pulse train supplying means supply a direct-current voltage component to the cells while said first pulse train is not supplied to the electrodes of said first pulse train is not supplied to the electrodes of said first electrode group disposed on one side of said cells.

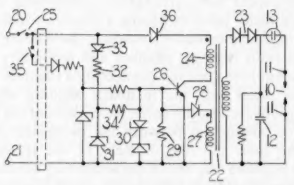


3,869,645

SPARK IGNITION SYSTEMS

Keith Douglas Collins, Watford, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Mar. 26, 1973, Ser. No. 344,553
Claims priority, application Great Britain, Mar. 25, 1972, 14117/72
Int. Cl. F02c *7/26*
U.S. Cl. 315—209 T **4 Claims**



1. A spark ignition system for continuous combustion gas turbine engines comprising a capacitor, a spark gap connected in series with the capacitor and a pair of output terminals, said output terminals in use, being connected to a spark discharge device associated with the engine, the spark gap acting when the voltage across the capacitor attains a predetermined value, to provide a conductive path so that the capacitor is discharged through said device, means for charging the capacitor, said means comprising a power supply including a transformer having primary and secondary windings, rectifier means connected in series with said secondary winding and the capacitor, means for applying a pulsed electric supply to the primary winding of the transformer, and further means for

adjusting the peak current flowing in the primary winding of the transformer whereby the rate of change of the capacitor and the spark discharge rate can be adjusted.

3,869,646
ELECTROLUMINESCENT DEVICES

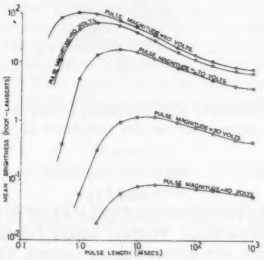
John Kirton, Malvern; Adrian Leonard Mears, Cheltenham; Richard William Sarginson, Malvern, and Norman John Werring, Dartford, all of England, assignors to the Secretary of State for Defense in Her Britannic Majisty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 22, 1973, Ser. No. 362,705

Claims priority, application Great Britain, Nov. 28, 1972, 54853/72

Int. Cl. H01j *1/62*; **H05b** *33/10*

U.S. Cl. 315—246 **9 Claims**



1. An electroluminescent device suitable for use with the application of unidirectional electric fields comprising a piece of electroluminescent phosphor material of the kind having a localized region of high resistivity produced by forming, and means for applying across at least a part of said region a series of unidirectional voltage pulses, said pulses having pulse heights whose average for the series is significantly greater than the forming voltage for the piece and pulse lengths whose average for the series is a value operative to provide emission of light having a brightness corresponding to the upper part of the peak of the pulse response characteristic for the piece at said average pulse height.

3,869,647
DISPOSABLE SHOE COVERING

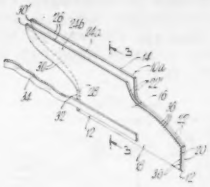
Richard D. Cooper, St. Hilaire, Quebec, Canada, assignor to Johnson & Johnson, New Brunswick, N.J.

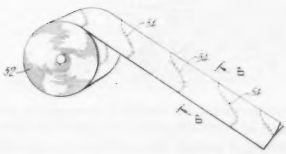
Filed Dec. 7, 1972, Ser. No. 313,019

Int. Cl. H05f *1/00, 3/00*

U.S. Cl. 317—2 B **9 Claims**

1. A foot covering of a length of flexible material, said foot covering comprising a pair of opposed similar panels joined together along a bottom edge thereof and forming therebetween a sole portion for said foot covering, said panels being further joined together about a front margin along a side adjacent said bottom margin to form therebetween at least a partially enclosed area adapted to at least partially enclose a foot or shoe of a user; and integral extensions of said opposed panels extending rearwardly thereof and forming a pair of tieing members, each of said opposed panels, in a lay-flat condition, including a front margin having a first portion extending upwardly from the base of said panel and second portion tapering inwardly and upwardly from said first portion to the top of said panel, each said panel including a rear margin having a substantially similar contour to the contour of the margin of said front portion of said panel, whereby said rear margin has a first portion extending upwardly from the base of said panel and a second upwardly and rearwardly extending portion forming the lower margin of said tieing member, the portions of the front and rear margins extending upwardly from the base having a height corresponding approximately to





the width of the sole portion formed by said side panels when said foot covering is mounted on a foot or shoe.

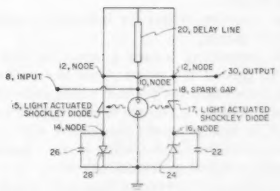
3,869,648
SUPPRESSOR OF FAST HIGH POWER ELECTRICAL TRANSIENTS

Bernard Zendle, Adelphi, and Marcella C. Petree, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 19, 1973, Ser. No. 408,246

Int. Cl. H02h *3/20*

U.S. Cl. 317—16 **7 Claims**



1. A circuit for suppressing transient signals between an input and an output comprising:

a spark gap connected between said input and a ground potential;

means for delaying said transients signals connected between said input and said output;

light activated semiconductor means connected to said output and physically positioned to accept light produced by said spark gap for conducting said transient signals which produce a forward bias across said light activated semiconductor means to said ground potential whenever said transient signals have sufficient magnitude to activate said spark gap;

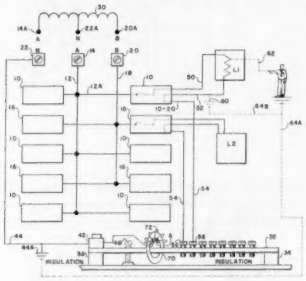
means connected between said light activated semiconductor means and said ground potential for producing a predetermined reverse bias level on said light activated semiconductor means to cause said light activated semiconductor means to insulate said transient signals from said ground potential until the magnitude of said transient signals falls below said predetermined reverse bias level.

3,869,649

ELECTRICAL PROTECTIVE PANEL ASSEMBLY WITH SENSITIVE GROUND FAULT PROTECTING MEANS

Charles F. Hobson, Jr., Southington, Conn., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 13, 1973, Ser. No. 350,825
Int. Cl. H02h *3/32, 7/22*
U.S. Cl. 317—18 D **4 Claims**



1. An electrical protective circuit for supplying power to an electrical load and including means responsive to the occurrence of unintended ground connection between at least one load supplying conductor and ground comprising:

a. a support;

b. an electrical circuit protective device supported on said support and having a first terminal for connection to one side of an electrical power source and a second terminal for connection to an outgoing conductor for supplying power to a remote power consuming load, said device including means for interrupting current to such outgoing conductor;

c. return conductor electrical connecting means supported on said support for connection to a return conductor from such power consuming load;

d. terminal connecting means supported on said support for connection to the side of such power source opposite from such one side, and conductor means connecting said terminal connecting means to said return conductor connecting means;

e. voltage inducing means for inducing a voltage in said conductor means;

f. ground connecting means connecting said conductor means to ground at a point closer to said terminal connecting means than the point at which said voltage inducing means induces a voltage in said conductor means;

g. current detecting means associated with said ground connecting means for detecting current therein, and for developing a signal in response thereto;

h. means connected between said current detecting and said circuit interrupting device for causing automatic opening of said circuit interrupting device upon the generation of a predetermined signal by said current detecting means.

3,869,650

DISCONNECTOR

Francis V. Cunningham, Western Springs, and John S. Wicks, Glen Ellyn, both of Ill., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

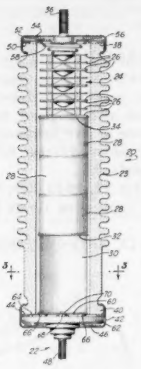
Filed May 30, 1973, Ser. No. 365,164
Int. Cl. H02h *3/22*
U.S. Cl. 317—61 **43 Claims**

1. A disconnector for a surge arrester of the type having a first elongated insulating arrester housing and arrester components disposed in the interior of said first housing, said disconnector comprising

an electrical terminal,

means for supporting said terminal,

means for separating said terminal from said supporting means upon the occurrence of a fault condition and means for directly or positively venting the interior of said first housing to the interior of said disconnector prior to the operation of said separating means and to the atmosphere subsequent to the operation of said separating means.

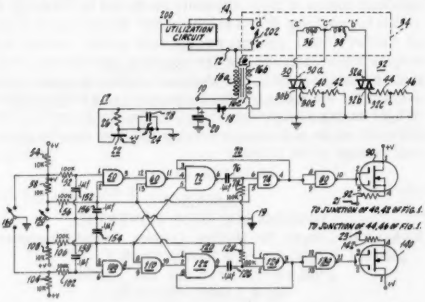


3,869,651

SOLID STATE, CONTROLLABLE ELECTRIC SWITCH

Donald Charles Long, Yardley; Albert Charles Hartsough, Willingboro, and Robert Fincher Sanford, Titusville, all of N.J., assignors to Princeton Electro Dynamics, Inc., Princeton Junction, N.J.

Filed Dec. 10, 1973, Ser. No. 423,229
Int. Cl. H01h *47/32*
U.S. Cl. 317—155.5 **7 Claims**



1. A controllable electrical switch comprising;

first and second terminals; and

actuating means for making electrical connection between said terminals when closing said switch and for breaking said electrical connection when opening said switch;

said actuating means including:

a. a bistable electromechanical relay having an input electrode coupled to said first terminal and an output electrode coupled to said second terminal and conditionable to one of a low and high impedance state between its input and output electrodes as a function of current flow therein;

b. a pair of semiconductor control devices, each having an input circuit and each having an output circuit respectively coupled to said electromechanical relay such that a conductivity condition in one of said devices produces a current flow in said relay as to place it in its low impedance state and such that a conductivity condition in the other of said devices produces a

current flow in said relay as to place it in its high impedance state; and

c. solid state control means for signal pulsing the input circuits of said semiconductor control devices to change the conductivities thereof, with said changes in conductivity conditions serving to change the current flow through the output circuits of said control devices to change the impedance state of said bistable relay in actuating said electrical switch from a make to a break condition and vice versa;

said solid state control means including a pair of pulse triggering circuits, one of which is controllable to first voltage condition for enabling the development of said signal pulses to change the conductivity of said one semiconductor device and controllable to a second voltage condition for inhibiting the development of said signal pulses therefor, and the other of which is controllable to said first voltage condition for enabling the development of said signal pulses to change the conductivity of said other semiconductor device and controllable to said second voltage condition for inhibiting the development of said signal pulses for said other device, and with only one of said pulse triggering circuits being controllable to said first voltage condition at any given instant of time.

3,869,652

METAL OXIDE DIELECTRIC LAYERS FOR CAPACITORS

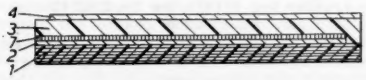
Jean Paul Maillot, Saint-Berthevin-les-Lavai, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 14, 1973, Ser. No. 341,184

Claims priority, application France, Mar. 15, 1972, 72.08961

Int. Cl. H01g *9/05, 3/17*

U.S. Cl. 317—230 **7 Claims**



1. A wound capacitor comprising an insulating support layer, a first metallized electrode layer on said support layer, a manganese dioxide layer on said first electrode layer, a metal oxide dielectric layer on said manganese dioxide layer, and a second metallized electrode layer on said metal oxide dielectric layer, said metal oxide dielectric layer being an oxide of a metal other than that of the metal of said second electrode layer.

3,869,653

ON-OFF CONTROL DEVICE FOR DC ELECTRIC MOTOR

Isao Masuzawa, Kuki; Kazutoshi Onishi, and Tsuneo Awano, both of Yokohama, all of Japan, assignors to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.), Tokyo, Japan

Filed July 5, 1973, Ser. No. 376,346

Claims priority, application Japan, July 10, 1972, 47-68930

Int. Cl. H02p *3/00*

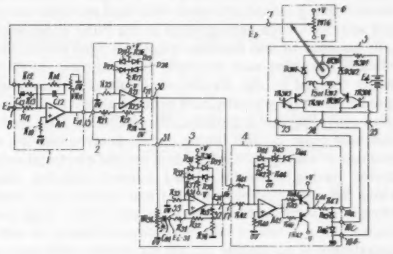
U.S. Cl. 318—364 **7 Claims**

1. An ON-OFF control device for a DC electric motor comprising:

a switching means for controlling a DC electric motor;

a first means connected to said switching means and producing on- and off-signals to control said switching means with said on- and off-signals so as to drive said DC electric motor in either direction;

a second means connected to said first means for receiving its output signals and producing on- and off-signals having a polarity which is opposite to that produced by said first means, said on- and off-signals from said second means supplied to said switching means, said second means producing on- and off-signals when said first means is changed from its on-state to off-state, said on- and off-signals from said second means having time durations related to the time interval during which said first means is in the on-state, and said second means controls said switching means so as to apply a braking signal to said DC electric motor,



said second means including a differentiation circuit consisting of a capacitor, and a circuit having on- and off-characteristics,

a circuit connected to said capacitor and in which the charging current path of said capacitor differs from its discharge current path,

said circuit including complementary type transistors and diodes.

3,869,654

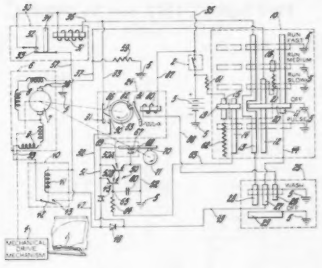
WINDSHIELD WIPER CONTROL CIRCUIT

Leo E. Bischoff, Centerville, and Chris F. Keller, Jr., Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 3, 1974, Ser. No. 466,614

Int. Cl. A47l *1/04;* **B60s** *1/08;* **H02p** *1/04*

U.S. Cl. 318—443 **4 Claims**



1. A windshield wiper control circuit comprising in combination with a windshield wiper and an electric drive motor having an armature and at least a shunt field winding for driving the windshield wiper over a normal wipe pattern between inner and outer wipe positions; an electrical relay having an operating coil and normally open contacts; and energizing circuit for said relay operating coil including first, second and third circuit branches all connected to the same terminal end thereof; an energizing circuit for said motor shunt field winding; an energizing circuit for said motor armature including said normally open contacts of said relay in series; an electrical selector switch having a plurality of stationary contacts and two gang-operated movable contacts operable to at least Off, Run and Pulse positions, one of said movable contacts and one of said stationary contacts being connected

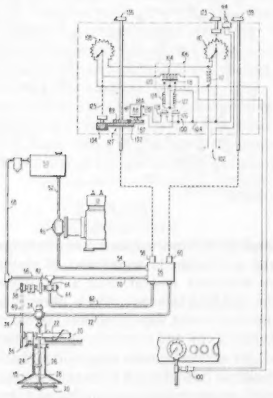
in series in said first circuit branch of said relay operating coil energizing circuit and arranged to be in electrical circuit closed condition when said movable contacts are in said Off and Run positions and in the electrical circuit open condition when said movable contacts are in said Pulse position; a first electrical switching device having normally open current carrying elements electrically operable to the electrical circuit closed condition connected in series in said second circuit branch of said relay operating coil energizing circuit; a pulse control timing circuit activated while said movable contacts of said selector switch are operated to the Pulse position electrically coupled to said first electrical switching device for periodically operating said normally open current carrying elements thereof to the electrical circuit closed condition at spaced intervals whereby said second circuit branch of said relay operating coil is periodically completed at spaced intervals, said pulse control timing circuit determining the repetition rate of said spaced intervals; a second electrical switching device having normally closed current carrying elements which are operated to the electrical circuit open condition when said windshield wiper is in said inner wipe position connected in series in said third circuit branch of said relay operating coil energizing circuit for closing said third circuit branch when said windshield wiper is moved away from said inner wipe position and for interrupting said third circuit branch when said windshield wiper is in said inner wipe position; and a power switching device having current carrying elements which operate to the electrical circuit closed condition in response to the operation of said movable contacts of said selector switch to either said Run position or said Pulse position connected in series in said motor shunt field winding energizing circuit, said motor armature energizing circuit and said relay operating coil energizing circuit whereby said drive motor is continuously energized while said movable contacts of said selector switch are in said Run position and said motor is periodically energized at spaced intervals while said movable contacts of said selector switch are in said Pulse position.

3,869,655

MOTOR CONTROLLED MATERIAL SPREADING VEHICLES

Eugene A. Sousek, Appleton, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed Sept. 27, 1972, Ser. No. 292,821
Int. Cl. G05b *7/00*
U.S. Cl. 318—591 **17 Claims**



1. In a material spreading vehicle having an operator's drive station; prime mover means; container means for carrying a supply of material for being spread onto a roadway; an auxiliary driven spreader mechanism carried by said vehicle remotely of said operator's station for spreading said material at a selected rate; said auxiliary driven mechanism including auxiliary motor means; said auxiliary motor means including adjustable means for regulating the output of said auxiliary motor means; and control means for shiftng said adjustable means to vary the rate of material spreading; said control means comprising:

control motor means;

coupling means for drivingly connecting said control motor means to said adjustable means;

means for automatically operating said control motor means in relation to the speed of said vehicle;

manually operable override means disposed at said operator's station and operably connected to said coupling means for selectively disengaging said control motor means from driving connection with said adjustable means to afford manual shifting of said adjustable means by override independently of said control motor means; and

follow-up means operably connectable to said control motor means for controlling said control motor means in response to the orientation of said adjustable means;

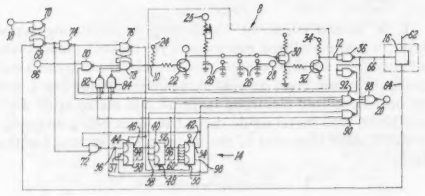
said coupling means including means for operably coupling said follow-up means and said adjustable means during automatic operation of said adjustable means by said control motor means and for maintaining such operable coupling during manual disengagement of said control motor means from said adjustable means by said override means to automatically return said adjustable means to an original pre-set posture subsequent to manual adjustment of said adjustable means by said operator.

3,869,656

CIRCUIT FOR MODIFYING A TRAIN OF PULSES

Daniel W. Kennedy, Boston, and Walter R. Woodward, Carlisle, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed Aug. 8, 1972, Ser. No. 278,742
Int. Cl. G05b *19/40*
U.S. Cl. 318—696 **1 Claim**



1. Apparatus for generating a pulse train used for driving a stepping motor, said motor being subject to possible torque reversal under certain conditions of acceleration and deceleration comprising:

A. a pulse generator for supplying a train of pulses suitable for driving a stepping motor;

B. a control circuit connected to the pulse generator for adjusting the pulse repetition rate of said pulse generator according to a predetermined sequence;

C. first blanking means responsive to the control circuit for deleting the third pulse occurring after acceleration begins from the pulse train, said pulse occurring at or immediately before the point of possible torque reversal during acceleration;

D. second blanking means responsive to the control circuit for deleting the third pulse occurring after deceleration begins from the pulse train, said pulse occurring at or immediately before the point of possible torque reversal during deceleration; and

E. means for allowing the pulse generator to add the number of pulses deleted to the end of the pulse train.

3,869,657

QUICK CHARGING APPARATUS

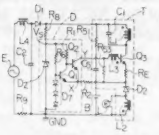
Magozo Shoji, Kadoma, and Motoharu Kitamura, Osaka, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed June 22, 1972, Ser. No. 265,301

Claims priority, application Japan, June 30, 1971, 46-57685[U]

Int. Cl. H02j 7/04

U.S. Cl. 320—39 **11 Claims**



1. A controlled quick charging apparatus comprising a charging current source section for charging a battery to be charged, a detecting section for detecting the charging voltage of the battery to be charged, a current source section for operating said charging current source section and detecting section, and a controlling section for controlling the operation of the charging current source section in response to an output signal of the detecting section, said detecting section comprising a constant voltage device, a series circuit of a regulating resistance and a diode means and connected in parallel with said constant voltage device, a first transistor in which a constant voltage at an intermediate position between said regulating resistance and diode means of the series circuit is applied to the base, and a second transistor connected in the form of a common emitter with the first transistor, and said battery to be charged being inserted so as to be connected on its positive electrode side with the common emitter side of said first and second transistors and on its negative electrode side with the negative electrode side of the constant voltage device and with the negative electrode side of said diode means for reverse biasing said first and second transistors by the battery voltage, said first and second transistors being responsive to a predetermined battery voltage for producing said output signal to which said controlling section is responsive.

3,869,658

DIRECT CURENT SUPPLY WITH RIBBLE SUPPRESSION

Martin Hanke, and Hans Stiefken, both of Constance, Germany, assignors to Telefunken Compter GmbH, Kanstanz, Germany

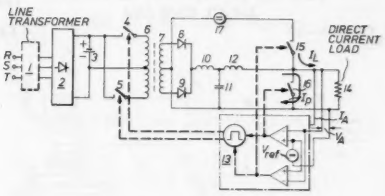
Filed Sept. 18, 1973, Ser. No. 398,406

Claims priority, application Germany, Sept. 22, 1972, 2246505

Int. Cl. H02m 1/14

U.S. Cl. 321—2 **6 Claims**

1. In a circuit arrangement for supplying an interruption-free current for a direct current load, the arrangement including a first rectifier, connected to receive an alternating supply voltage, for rectifying the supply voltage; an energy store coupled to the output of the first rectifier for storing the rectified voltage; inverting means with phase cut control for chopping up the rectified voltage into an alternating voltage; a transformer with a primary winding coupled to the inverting means for receiving the chopped voltage and a first secondary winding with both the primary and secondary windings having center taps; a second rectifier coupled to the first secondary winding of the transformer for rectifying the chopped voltage; a smoothing filter coupled to the output of the second rectifier and having its output connected to the direct current load; and control means for monitoring the current and voltage values at the direct current load and for controlling the inverting means in dependence upon these values; the improvement comprising: first electrical switching means coupled to the output of said control means and connected for providing an extra current to said direct current load in response to control



signals received from said control means when the voltage across said direct current load falls below a rated value; and second electrical switching means coupled to the output of said control means and connected for diverting a portion of the current through said direct current load in response to control signals received from said control means when the voltage across said direct current load increases above a rated value.

3,869,659

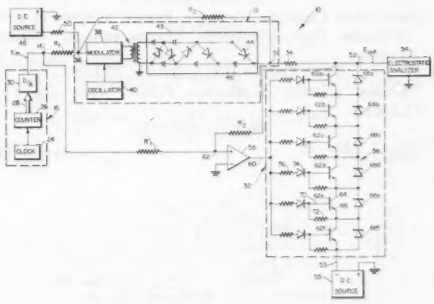
CONTROLLABLE HIGH VOLTAGE SOURCE HAVING FAST SETTLING TIME

Henry Doong, Beltsville, and Mario H. Acuna, Bowie, both of Md., assignors to The United States of America as represented by the Administration of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 19, 1974, Ser. No. 452,761

Int. Cl. H02m 5/20

U.S. Cl. 321—15 **16 Claims**



1. A controllable high voltage source having a relatively fast response to a low voltage input signal source with a predetermined gain comprising:

a pair of input terminals for said input signal source;

a pair of output terminals for high voltage output;

a relatively long response time controllable high voltage source coupled between said input and output terminals, said long response time source having said predetermined gain;

means for d.c. biasing said long response time controllable voltage source to have an output voltage in excess of the input signal times said gain; and

fast response time shunt regulator means coupled across said output terminals responsive to said input signal at said input terminals for reducing the output voltage

across said output terminals to said gain times said input signal.

3,869,660

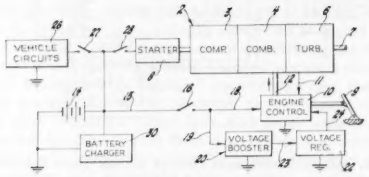
VOLTAGE BOOSTER

James L. Davis, Kokomo, and Leslie Joseph Pechous, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1973, Ser. No. 410,017

Int. Cl. G05f 1/64

U.S. Cl. 323—17 **4 Claims**



1. A voltage booster comprising, in combination, an inductive reactance, a junction point, a rectifier, and a storage capacitor connected in series across an input line; an output line connected across the capacitor; intermittently operable switching means connecting the junction point to the input so as to short circuit the reactance across the input when closed; a multivibrator controlling operation of the switching means, the multivibrator including a timing capacitor charged from the said junction point when the switch means is open and discharged when the switch means is closed; a mixing circuit including a point with a potential responsive to input and output potentials of the booster; and connecting means effective to limit potential swings of the timing capacitor relative to the potential at the said point.

3,869,661

STIMULATING DEVICE HAVING A CONTROLLED POWER

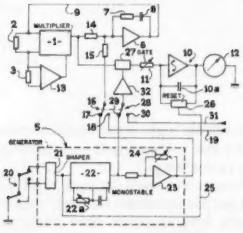
Albert Rene Castaigne, Toulouse, France, assignor to Centre D'Etudes Pour L'Industrie Pharmaceutique, Toulouse, France

Filed June 21, 1973, Ser. No. 372,292

Claims priority, application France, June 26, 1972, 72.23013

Int. Cl. G05f 1/50

U.S. Cl. 323—20 **3 Claims**



1. A device for applying to a variable load, in particular to living beings, electric signals of defined power, comprising an analogue multiplier having input voltage terminals adapted to be connected to the load to multiply the voltage difference across said terminals to produce an output signal, a reference pulse generator producing a reference signal, a comparator for receiving and comparing said signals and for producing an error signal in response to any difference in said output and reference signals, means for applying said error signal to said load, an integrator of the output signal of the multiplier, and means for reading the energy output signal of the integrator, said generator comprising a switch having a pushbutton, a shaping circuit, a monostable circuit, and an amplifier, an output of the shaping circuit being connected to an input of the monostable circuit and the monostable circuit having an output connected to the input of the amplifier.

3,869,662

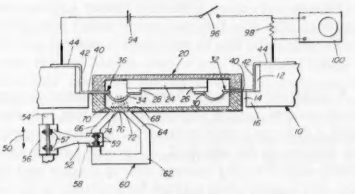
APPARATUS FOR CONTROLLABLY STRESSING INTERNAL CONDUCTORS OF A CLOSED DEVICE

Aaron C. Der Marderosian, Marlboro; Paul E. Nelson, Maynard, and Donald F. Stinnett, Framingham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 233,532, March 10, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,685

Int. Cl. G01r 33/00

U.S. Cl. 324—34 R **5 Claims**



1. Apparatus for controllably stressing internal conductors of a closed device, the apparatus comprising:

support means for positioning an internal conductor of the device in a preferred location;

magnetic means supported adjacent an exterior surface of the device for establishing adjacent the conductor an arcuate magnetic field having a localized region of maximum intensity adjacent the exterior surface and for pulling the conductor toward the region of maximum intensity; and

electrical means operatively connected to the internal conductor for passing an electrical current through the conductor in cooperation with the action of the magnetic field, the electrical means including monitoring means for determining if the conductor is at least partially separated from a connecting portion of the device by the action of the magnetic field.

3,869,663

METHOD AND APPARATUS FOR CHECKING METALLIC OBJECTS BY MONITORING ITS EFFECT ON ONE CYCLE OF AN ALTERNATING FIELD

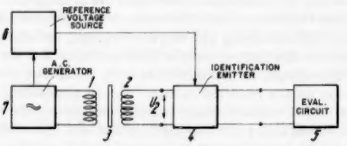
Klaus Tschierse, Berlin, Germany, assignor to Berliner Maschinenban-Actien-Gesellschaft, Berlin, Germany

Filed June 12, 1972, Ser. No. 261,630

Claims priority, application Germany, June 11, 1971, 2130057

Int. Cl. G01r 33/12

U.S. Cl. 324—41 **14 Claims**



1. A system for checking metallic objects, such as coins or the like comprising means for generating a periodically alter-

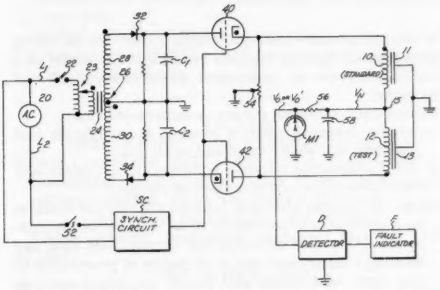
nating field through which the object is moved, detector means for measuring the change in the field at a measuring point caused by the presence of the object and providing an output signal having an alternating waveform, and evaluation circuit means connected to said detector means for comparing the positive or negative amplitude of the alternating signal within one period of the signal spread over its peak value, with a defined range of tolerance formed by two different reference voltages such that a "good-indication" of the object occurs, only if the amplitude lies between the two reference voltages, and resetting means for resetting said evaluation circuit means for each period of the signal evaluated.

3,869,664

IMPROVED SURGE TESTER FOR ELECTRICAL WINDINGS

Michael B. Safer, Shaker Heights, and Andrew J. Menegos, Copley, both of Ohio, assignors to Avtron Manufacturing, Inc., Cleveland, Ohio

Filed June 8, 1973, Ser. No. 368,306
Int. Cl. G01r *31/02, 31/06*
U.S. Cl. 324—51 **10 Claims**



1. A surge tester for testing an electrical winding and comprising:

means for simultaneously applying first and second surge voltage pulses to a test winding and a standard winding in synchronism with half cycles of one polarity of an AC voltage source, said voltage applying means including means for deriving said voltage pulses from a said AC voltage source;

fault detector means for providing a turn on signal in dependence upon the magnitude of any difference in the voltages developed across said windings in response to application of said surge voltage pulses;

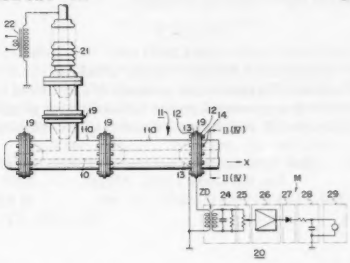
fault indicator circuit means including electronic control means for receiving a said turn on signal and exhibiting the characteristic of being gated to a conductive condition only upon receipt of said turn on signal during a time period that the potential applied to a first electrode thereof is more positive than that applied to a second electrode thereof, circuit means for connecting said first and second electrodes across a said AC voltage source in such a manner that said electronic control means is responsive to a said turn on signal only during half cycles of the opposite polarity of said AC voltage source.

3,869,665

DEVICE FOR DETECTING CORONA DISCHARGE IN AN ENCLOSED ELECTRIC DEVICE

Hiroshi Kenmochi, Fujisawa; Shinichi Menju, Atsugi, and Kunio Takahashi, Yokohama, all of Japan, assignors to Tokyo Shibaura Co., Ltd., Kawasaki-shi and Tokyo Electric Power Co., Ltd., Tokyo, both of, Japan

Filed Nov. 8, 1973, Ser. No. 413,973
Claims priority, application Japan, Nov. 10, 1972, 47-112641
Int. Cl. G01r *31/02, 31/12*
U.S. Cl. 324—72 **3 Claims**



1. In an enclosed electric device in which a conductor to be charged with a voltage is supported within an enclosing metal case by a plurality of insulation supports spaced apart from each other along said conductor, said enclosing metal case being filled with an insulating gas,

a corona discharge detecting device comprising:

a plurality of electrodes each coupled to a respective insulation support for providing a first static capacitance (**C1**) relative to said conductor and a second static capacitance (**C2**) relative to said enclosing metal case; and

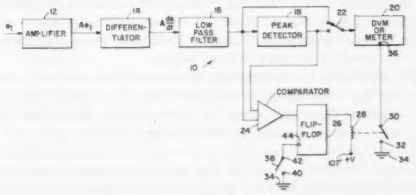
a corona discharge detector adapted to be connected in parallel with said second static capacitance (**C2**) and to detect, with said first static capacitance (**C1**) serving as a coupling capacitor, a corona discharge occurring from said conductor and insulation supports.

3,869,666

MAXIMUM SLOPE DETECTORS

Julian Saltz, 16 Benford Dr., Princeton Junction, 08550, and Joseph C. Wasilewski, 29 Melville Rd., Cranbury, both of N.J. 08512

Filed Dec. 26, 1973, Ser. No. 428,042
Int. Cl. G01r *19/12*
U.S. Cl. 324—76 R **11 Claims**



11. A slope detecting instrument for determining the maximum slope of an electrical signal provided by a signal source comprising:

a. means coupled to said signal source for amplifying said electrical signal, said amplifying means having a relatively low frequency response;

b. means coupled to said amplifying means for differentiating said amplified signal;

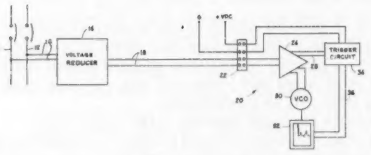
c. means coupled to said differentiating means for filtering said differentiated signal, said filtering means having a

relatively low cut-off frequency for eliminating noise appearing on and introduced into said electrical signal;
d. means coupled to said filtering means for peak detecting said filtered signal;
e. means coupled to said filtering means and said peak detecting means for comparing said peak detected signal and said filtered signal;
f. means coupled to said peak detecting means for displaying said peak detected signal or said filtered signal;
g. means coupled to said comparing means for causing said displaying means to hold its last display when said peak detected signal starts to decrease.

3,869,667
VOLTAGE MONITORING SYSTEM

Carl L. Canicatti, Savannah, Ga., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 6, 1973, Ser. No. 348,787
Int. Cl. G01r *13/04, 27/28*
U.S. Cl. 324—113 **6 Claims**

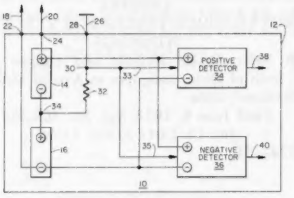


1. A system for monitoring the voltage at a remote location for determining when said voltage exceeds an upper level or drops below a lower level comprising:
A. voltage reducing means coupled to said voltage to be monitored for reducing said voltage to a predetermined level,
B. a voltage analyzer located at a station remote from said voltages being monitored,
C. transmission lines coupled to said voltage reducing means for transmitting said reduced voltage to said voltage analyzer,
D. said voltage analyzer including:
E. an amplifier means for amplifying said reduced voltage producing an amplified voltage,
F. a full wave rectifier coupled to said amplifier means for rectifying said amplified voltage producing a rectified signal,
G. an over-voltage sensing unijunction transistor coupled to said full wave rectifier for being activated when said voltage rises above an upper predetermined voltage level, to produce an over-voltage signal,
H. adjustable resistor means interposed between said over-voltage sensing unijunction transistor and said full wave rectifier for controlling the upper voltage level that said over-voltage sensing unijunction transistor is activated,
I. an under-voltage sensing unijunction transistor coupled to said full wave rectifier for being activated when said voltage drops below a predetermined lower level to produce an under-voltage signal,
J. adjustable resistor means interposed between said under-voltage sensing unijunction transistor and said full wave rectifier for controlling the lower voltage level that said under-voltage sensing unijunction transistor is activated, and
K. recorder means coupled to an output of said amplifier means whereby said recorder records said amplified voltage so that it can be subsequently analyzed,
L. means coupled to the outputs of said over-voltage and under-voltage unijunction transistors for activating said recorder means responsive to receiving an over-voltage or under-voltage signal.

3,869,668
UNDERWATER ELECTRICAL POWER LEAKAGE CURRENT DETECTOR

John R. Thompson, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1973, Ser. No. 410,010
Int. Cl. G01r *19/16, 31/02*
U.S. Cl. 324—133 **6 Claims**



1. An underwater diver protection device for detecting electrical-power leakage currents as small as two-tenths of a microampere from an underwater power source and tool comprising:
a water-tight, oil-filled, pressure-compensated case;
means for detecting positive voltages, located inside said case, having a sensor input and an output;
means for detecting negative voltages, located inside said case, having a sensor input and an output;
means for sensing electrical leakage currents as small as two-tenths of a microampere in an underwater environment, said means extending out through said case and forming a water-tight seal at all points of penetration of said case, said means also having an output terminal located inside said case, said output terminal being connected to the sensor input of said means for detecting positive voltages and to the sensor input of said means for detecting negative voltages;
means connected between said output terminal of said means for sensing electrical currents and the power source for creating a voltage that is a function of the current sensed by said means for sensing electrical currents, thereby providing a voltage input to said means for detecting positive voltages and said means for detecting negative voltages whereby said means for detecting positive voltages and said means for detecting negative voltages output a trip signal when said leakage currents are sensed.

3,869,669
SYSTEM FOR HIGH FREQUENCY DIGITAL DATA TRANSMISSION

Cornelius Eldert, Ypsilanti, and Virgilio J. Quiegue, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 4, 1973, Ser. No. 394,292
Int. Cl. H04l *27/10*
U.S. Cl. 325—30 **11 Claims**

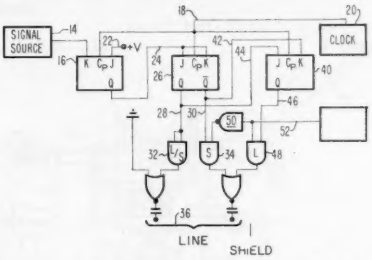
1. A high frequency digital data transmission system comprising:
encoding means for converting a bit pattern into an improved two-frequency differential signal wherein each bit state is represented by at least one full cycle of said differential signal said differential signal cycle comprised of the sum of a bit signal and the reciprocal of said bit signal

delayed by a predetermined portion of the cycle time said encoding means comprising:

a clock for generating clock pulses;

a first flip flop responsive to the bit pattern and said clock; a second flip flop responsive to said first flip flop for producing a bit signal;

a third flip flop responsive to said second flip flop for producing a delayed bit signal;



interface means to apply the combination of said bit signal and the reciprocal of said delayed bit signal to said transmission means thereby forming said improved differential signal;

a transmission means for transmitting said differential signal; and

receiver means responsive to said transmission means for converting said differential signal into a signal representing said bit pattern.

3,869,670

ARRANGEMENT FOR CARRYING SIGNALS

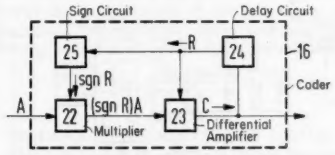
Sigmar Grutzmann; Heinz Sailer, both of Munich, and Gero Schollmeier, Gauting, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 14, 1973, Ser. No. 359,893

Claims priority, application Germany, May 16, 1972, 2223842

Int. Cl. H03k *13/22*

U.S. Cl. 325—38 A **5 Claims**



1. A circuit arrangement for transmitting amplitude-modulated signals capable of assuming a plurality of amplitude levels, said circuit arrangement including coding means and signal shaping means for forming, from said amplitude modulated signals, a composite signal comprising a plurality of partial response pulses, said composite signal being periodically sampled at a receiver at the end of each system clock period, said circuit arrangement comprising;

converter means including multiplier means for multiplying said amplitude modulated signal with a sign signal, said sign signal being capable of assuming one of two values, for providing a product signal which has an amplitude equal to that of the amplitude modulated signal and a polarity corresponding to the value of the sign signal,

difference means for receiving said product signal and producing therefrom a differential signal, the amplitude of which corresponds to the difference between the values of first and second signals,

delay means for receiving said differential signal and delaying same by a period corresponding to at least two periods of the system clock,

means for deriving said sign signal from said delayed differential signal and for coupling said sign signal to said multiplier means,

means for routing said multiplication signal and said delayed differential signal to said difference means as said first and second signals and

means for coupling said differential signal to said signal shaping means for producing said composite signal for transmission.

3,869,671

METHOD OF AND CIRCUIT ARRANGEMENT FOR OPERATING A CONTROL-SIGNAL TRANSMITTER FOR REMOTE-CONTROL EQUIPMENT

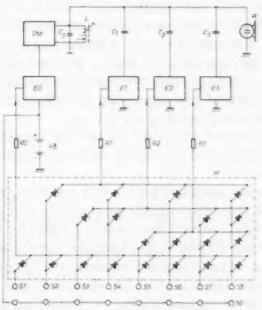
Wolfgang Schroder, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 27, 1973, Ser. No. 345,378

Claims priority, application Germany, Apr. 10, 1972, 2217124

Int. Cl. H04b *11/00, 1/04*

U.S. Cl. 325—118 **17 Claims**



1. A control signal transmitter for remote control equipment, comprising:

control signal generating means for providing a control signal;

at least one control element associated with said control signal generating means for controlling the frequency of the control signal when connected thereto;

power source;

electronic switch means, having a control input, for connecting the power source to the control signal generating means in response to a signal received at the control input;

further electronic switch means, having a control input, for operatively connecting the control element to the control signal generating means in response to a signal received at the control input of the further electronic switch means;

touch control switch means for connecting the power source to the control inputs of the electronic switch means and the further electronic switch means for providing a signal thereto so that the control signal generating means is activated and the control element is connected to the signal generating means to provide a predetermined control signal frequency;

means for rectifying the control signal; and

a capacitor connected to the rectifying means to be charged by the rectified control signal, said capacitor forming an additional voltage source for providing control and operating voltage for the electronic switch means.

3,869,672
METHOD AND ARRANGEMENTS FOR THE DIGITAL CONTROL OF OPERATING FUNCTIONS, RADIO AND TELEVISION RECEIVERS

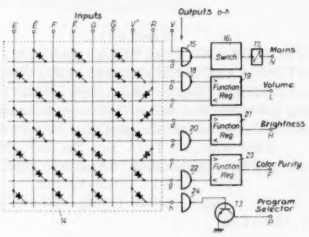
Wolfgang Schroder, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,880

Claims priority, application Germany, May 13, 1972, 2223487

Int. Cl. H04q *3/00*

U.S. Cl. 325—392 **14 Claims**



1. A command signal receiver for use in a remote control system of the type that controls a number of operating functions in a remote apparatus by transmitting a command signal having a frequency selected from a number of predetermined frequencies, each of said predetermined frequencies corresponding to one of said operating functions to be controlled, said receiver comprising:

command signal receiving means for receiving said command signal and providing an output signal in response thereto;

tuning means associated with said receiving means for tuning said receiving means successively and periodically to said predetermined frequencies, whereby the amplitude of the said output signal changes significantly when said receiver is tuned to the frequency of the command signal; amplitude filter means for receiving the output signal from the command signal receiving means and in response to said changed amplitude provides an amplitude signal at a filter output;

a number of output means each associated with an operating function for providing an output to said operating function; and

switch means connected to said filter output and associated with said tuning means and responsive thereto for successively connecting said filter output to each of said output means so that the filter output is connected to the output means associated with the operating function corresponding to the frequency to which the receiving means is tuned, whereby the amplitude signal is provided as periodic amplitude signal pulses for the digital control of the operating function corresponding to the selected frequency of the command signal.

3,869,673
METHOD AND APPARATUS FOR MEASURING MULTIPATH DISTORTION

Ernest Frederick Close, Fort Wayne, Ind., assignor to Magnavox Company, Fort Wayne, Ind.

Filed May 21, 1973, Ser. No. 361,902

Int. Cl. H04b *1/16*

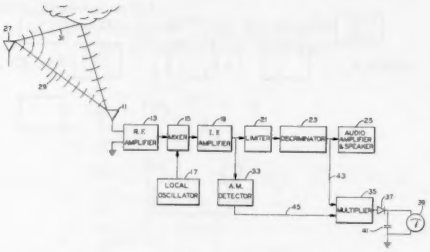
U.S. Cl. 325—393 **12 Claims**

1. In an FM receiver having a sequentially coupled radio frequency amplifier, mixer, intermediate frequency amplifier, limiter, frequency modulation detector and audio output stages; a circuit for providing a quantitative measure of the distortion present in a received signal due to propagation of that signal along paths of dissimilar lengths comprising:

an amplitude modulation detector having an input coupled to the receiver prior to the limiter and having an output;

multiple input amplifier means for providing an output signal the magnitude of which varies directly as a function of the magnitude of each input signal;

means coupling the output of the amplitude modulation detector to at least one of the amplifier means multiple inputs;



means coupling the output of the frequency modulation detector to at least another of the amplifier means multiple inputs;

indicator means coupled to the output of said amplifier means output to indicate the quantitative measure of said distortion present in a received signal; and

wherein the amplifier means comprises a multiplier circuit for forming the instantaneous product of the signals presented to the multiple inputs.

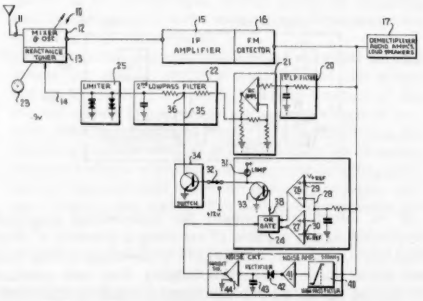
3,869,674
A.F.C. DISABLING CIRCUITRY

Erno Borbely, Newton Square, Pa., assignor to Dynaco Inc., Philadelphia, Pa.

Filed Dec. 26, 1972, Ser. No. 318,345

Int. Cl. H04b *1/14, 1/26*

U.S. Cl. 325—422 **11 Claims**



6. In a frequency modulation receiver, a frequency detector and a reactance tuner responsive to a signal from said detector, said signal approaching zero level when said tuner is tuned to the center frequency of a broadcast channel, feedback circuit means connected to said detector for automatically tuning said reactance tuner toward said center frequency only while said signal represents predetermined frequency deviation limits from said center frequency, means responsive to said signal only when said signal is above a predetermined level for disabling said feedback circuit, and means responsive to interchannel noise for disabling said feedback circuit.

3,869,675

HEATING ARRANGEMENT WITH FOCUSED ELECTRON BEAMS UNDER VACUUM

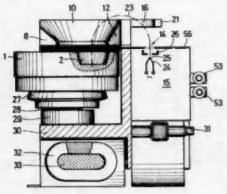
Ulrich F. M. Patz, Breslauer Str. 23, 875 Aschaffenburg; Peter Sommerkamp, Amselstr. 20-50, 6451 Hanau, and Julius Josephy, Beethovenstr. 18, 6451 Grosskrotzenburg, all of Germany

Filed Feb. 7, 1973, Ser. No. 330,177

Claims priority, application Germany, Feb. 2, 1972, 2206995

Int. Cl. H01j 29/68

U.S. Cl. 328—228 10 Claims



1. A heating arrangement comprising, in combination, a source of focused electron beam means under vacuum having a heating cathode and focusing means; electro-magnetic deflection means for deflecting and guiding said beam means along arc-shaped trajectories through an opening and a predetermined angle and onto a predetermined target surface; at least two pole piece systems in said electro-magnetic deflection means for establishing different magnetic fields, one of said pole piece systems having a predetermined shape with inclined surfaces forming a substantially V-shaped channel, whereby the field intensity of said one pole piece system decreases from the inner edge of said beam means to the outer edge of said beam means in the plane of said trajectories; and an auxiliary pole piece system having an axis directed perpendicular to the plane of said trajectories and arranged behind said cathode when viewed from said target surface, said auxiliary pole piece system having a predetermined shape with exit surfaces which are inclined in the direction toward said opening, whereby the field intensity of said auxiliary pole piece system decreases from the outer edge of said beam means to the inner edge of said beam means in the plane of said trajectories.

3,869,676

DIODE-QUAD BRIDGE CIRCUIT MEANS

Dean R. Harrison, Sunnyvale, and John Dimeff, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 209,618, Dec. 20, 1971, abandoned. This application Apr. 22, 1974, Ser. No. 462,844

Int. Cl. H03d 1/54

U.S. Cl. 329—204 11 Claims

1. A transducer circuit, comprising:

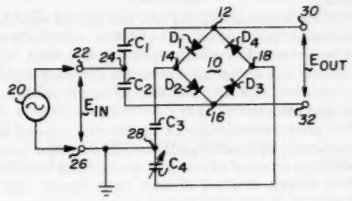
first and second input terminals;

a diode bridge including first, second, third and fourth bridge terminals consecutively coupled together by four diodes polarized in circulating relationship;

a signal source for developing a signal of balanced alternating polarity across said first and second input terminals;

a first capacitor coupling said first input terminal to said first bridge terminal, and a second capacitor coupling said first input terminal to said third bridge terminal; and

a first impedance means coupling said second bridge terminal to said second input terminal, and a second impedance means coupling said forth bridge terminal to said second input terminal, the impedance of at least one of said first and second impedance means being variable, and the impedances of each of said first and second capacitors being small with respect to the impedances of each of said first and second impedance means at the



frequency of said signal source, whereby an output signal developed across said first and third bridge terminals is proportional to the difference between the impedances of said first impedance means and said second impedance means divided by the sum of the impedances of said first impedance means and said second impedance means.

3,869,677

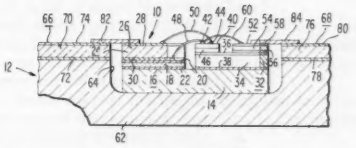
MICROWAVE TRANSISTOR CARRIER FOR COMMON BASE CLASS A OPERATION

Erwin Franz Belohoubek, and Adolph Presser, both of Kendall Park, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,576

Int. Cl. H03f 3/04

U.S. Cl. 330—31 8 Claims



1. A transistor carrier adapted to be mounted in a microwave stripline circuit operable at a given frequency comprising:

an electrically conductive substrate,

an input means,

an output means

a capacitor mounted on said substrate and having one side electrically connected to said substrate,

a transistor mounted on said substrate, said transistor including base, emitter and collector electrodes, the collector electrode being electrically connected to the output means, the emitter electrode being electrically connected to the input means and the base electrode being electrically connected to the other side of the said capacitor by a base lead having an inductance, said base lead and said capacitor being series resonant at said given frequency.

3,869,678

MULTIPLE TRANSISTOR MICROWAVE AMPLIFIER

Donald Edwin Mahoney, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 18, 1973, Ser. No. 425,936

Int. Cl. H03f 3/60

U.S. Cl. 330—53 5 Claims

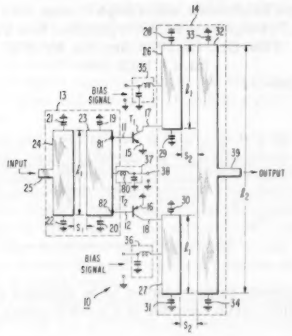
1. An amplifier comprising:

first, second, third, fourth and fifth resonant lengths of transmission lines each having center conductors with opposite ends capacitively coupled to a reference potential;

input circuit means having an input terminal and first and second output terminals and said first and second transmission line center conductors being respectively capacitively coupled to each other for dividing an input signal coupled to said input terminal between said output terminals with substantially equal magnitude and equal relative phase;

output circuit means having first and second input terminals and an output terminal and said third and fourth transmission line center capacitively coupled to said fifth transmission line center conductor for summing input signals coupled to said first and second input terminals of said output circuit;

a first semiconductor device having first, second and third terminals, an input impedance and an output impedance, said first terminal of said first device being coupled to said first output terminal of said input circuit, said second terminal of said first device being coupled to said first input terminal of said output circuit and said third terminal of said first device being coupled to said reference potential, said first and second transmission line center conductors being mutually arranged to match said first semiconductor input impedance and said third and fifth



transmission line center conductors being mutually arranged to match said first semiconductor output impedance;

a second semiconductor device having first, second and third terminals, an input impedance and an output impedance, said first terminal of said second device being coupled to said second output terminal of said input circuit, said second terminal of said second device being coupled to said second input terminal of said output circuit and said third terminal of said second device being coupled to said reference potential, said first and second transmission line center conductors being mutually arranged to match said second semiconductor input impedance and said fourth and fifth transmission line center conductor being mutually arranged to match said second semiconductor output impedance;

means for coupling an input microwave signal to said input circuit input terminal;

means for coupling a predetermined D.C. bias to said first and second semiconductor devices; and

means responsive to said input microwave signal and said D.C. bias for coupling an output microwave signal from said output circuit output terminal.

3,869,679

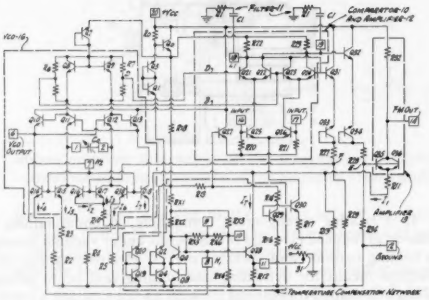
PHASE LOCKED LOOP WITH LIMITED TRACKING RANGE

Alan B. Grebene, Saratoga, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 381,041, July 20, 1973, abandoned, which is a division of Ser. No. 283,555, Aug. 24, 1972, abandoned, which is a continuation of Ser. No. 105,538, Jan. 11, 1971, abandoned. This application Jan. 28, 1974, Ser. No. 437,148

Int. Cl. H03b *3/04*; **H03k** *3/282*

U.S. Cl. 331—8 **2 Claims**



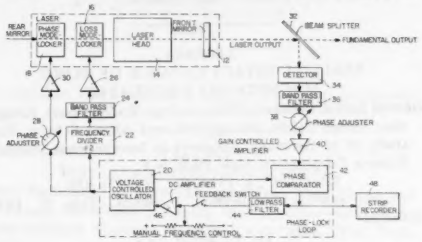
1. In a phase locked loop, a phase comparator for receiving an input signal and providing an output, filtering means coupled to the output of the phase comparator and providing a filtered output serving as a frequency control signal, and a voltage controlled oscillator coupled between the output of said filter means and the phase comparator said voltage controlled oscillator having a free running frequency of oscillation, said voltage controlled oscillator being responsive to the magnitude of said frequency control signal for producing an output signal having a frequency related to such magnitude of said frequency control signal, said voltage controlled oscillator including an input terminal and an output terminal, a multivibrator coupled between said input terminal and said output terminal for respectively receiving said frequency control currents, and producing said output signal, said multivibrator including first and second transistors, load means coupled to said first and second transistors, cross coupling means coupling said transistors to provide regenerative feedback between said transistors, said cross coupling means including a timing capacitor, means for charging the timing capacitor including a constant current source for supplying a constant current, I_5, to said timing capacitor to substantially determine said free running frequency of oscillation, f_o, and a variable current source for supplying a variable current, I_2, to said timing capacitor, the sum of said current, $I_2 + I_5$, determining said frequency of said output signal, said summed currents being alternately switched by said first and second transistors, means for controlling said variable current from said variable current source in accordance with said frequency control signal whereby the frequency deviation, Δf, of said output signal of said multivibrator is substantially independent of the free running frequency of oscillation of the multivibrator and means coupled to said variable current source for limiting, I_2, to a maximum value, $I_{2(MAX)}$, the maximum frequency deviation of said output signal being determined by

$$(\Delta f/f_o)_{MAX} = [I_{2(MAX)}/I_{2(MAX)} + I_5].$$

3,869,680
DUALLY MODE-LOCKED ND:YAG LASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; John Osmundsen, 100 E. Middlefield Rd., Apt. 1K, Mountain View, Calif. 94040; H. Edward Rowe, General Delivery, Laurel, Md. 20810, and Dominick Santarpia, 13111 Taney Dr., Beltsville, Md. 20705

Filed Aug. 31, 1973, Ser. No. 393,528
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 M **9 Claims**



1. A method of mode-locking a pulsed laser system of the type including a laser cavity defined by a pair of at least partially reflecting mirrors with an active gain lasing medium disposed in the cavity, said method comprising the steps of:

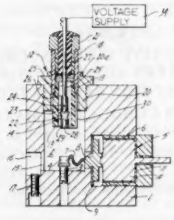
inserting a loss-modulator mode-locking element and a phase modulator mode-locking element into the laser cavity in optical series with one another to effect simultaneous loss mode-locking and phase mode-locking;

generating modulation drive signals to each mode-locking element such that each mode-locking element produces an output pulse train of substantially the same repetition rate; and timing the mode-locked pulses so produced such that the pulses leaving the phase modulator mode-locking element and propagating toward the loss modulator mode-locking element arrive at the loss modulator mode-locking element when transition through the loss mode-locker is at a maximum.

3,869,681
MICROWAVE CAVITY OSCILLATOR HAVING A FREQUENCY TUNING ELEMENT

Carl F. Klein; Lawrence B. Korta, and James R. Bailey, all of Milwaukee, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Aug. 30, 1972, Ser. No. 285,048
Int. Cl. H03b *7/12*
U.S. Cl. 331—96 **14 Claims**

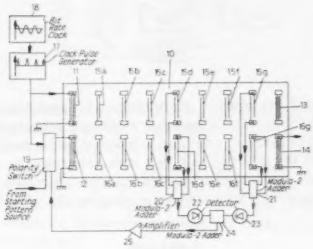


1. A microwave cavity oscillator tuning element for tuning of the cavity frequency of a cavity oscillator comprising a dielectric tuning means movably mounted within a cavity opening of said cavity oscillator and having an inner end, said dielectric tuning means constituting a first means to tune the cavity frequency, a voltage variable capacitor means mounted for movement with said dielectric tuning means and having an input terminal means and a coupling conductor means extending from the inner end of the dielectric tuning means, said variable capacitor means constituting a second means to further tune the cavity frequency.

3,869,682
SURFACE ACOUSTIC WAVE CODE GENERATOR

John Stuart Heeks, Harlow, and John Josiah Crisp, Little Hadham, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 10, 1974, Ser. No. 459,506
Claims priority, application Great Britain, May 3, 1973, 21070/73
Int. Cl. H03c *3/28;* **H03k** *13/00*
U.S. Cl. 332—11 R **17 Claims**



1. A binary code generator comprising:

a first surface acoustic wave tapped delay line;

first means for generating clock signals having a repetition rate equal to the binary code bit rate;

second means coupled to said first means and said first delay line for inserting phase modulated RF signals into the input of said first delay line, said second means being under control of said clock signals;

third means coupled to said first delay line to derive first and second output signals from first and second tapping points of said first delay line;

fourth means to derive for said first and second tapping points first and second phase reference signals by which the RF phase of said first and second output signals of said first and second tapping points can be checked;

fifth means coupled to said first and second tapping points and said fourth means to compare said first and second output signals with respect to said first and second phase reference signals resulting in third and fourth output signals;

sixth means coupled to said fifth means to perform a modulo-2 addition of said third and fourth output signals resulting in a fifth output signal; and

seventh means coupled to said sixth means to apply said fifth output signal as a feedback signal to said second means to modify said phase modulation of said phase modulated RF signals.

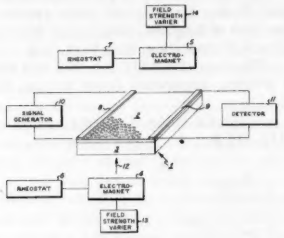
3,869,683
VARIABLE BROADBAND DELAY LINE

Martin M. Sokoloski, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,583
Int. Cl. H03h *9/00, 9/30;* **H04b** *11/00*
U.S. Cl. 333—30 R **9 Claims**

1. A magnetic bubble wave shaping apparatus for shaping an input signal in accordance with a desired wave shaping characteristic comprising a film of uniaxial magnetic material saturated with a two dimensional hexagonal array of magnetic bubbles, said film extending in a plane perpendicular to the

easy axis of said magnetic material and having at least two opposite ends which are spaced apart by a distance much greater than the nearest neighbor separation of the bubbles in said material, means for producing a magnetic field which is oriented transversely to said plane of said film, means for varying the strength of said field as a function of the distance



between said two ends in accordance with said desired wave shaping characteristic, a launcher electrode deposited on said film at one of said two ends and a detector probe deposited on said film at the other of said two ends, whereby the shape of an electrical signal applied to said launcher electrode is modified in accordance with said wave shaping characteristic.

3,869,684

BISTABLE LATCHING RELAY

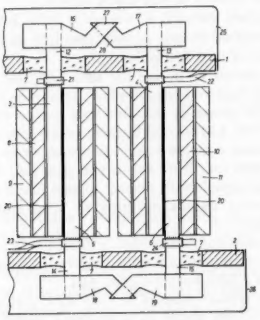
Wolfgang Grobe, Ludwigshafen, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 20, 1974, Ser. No. 453,147

Claims priority, application Germany, Apr. 6, 1973, 2317460

Int. Cl. H01h *1/66*

U.S. Cl. 335—152 **10 Claims**



1. A bistable latching relay comprising:

a base plate;

at least two reversible remanent-magnetic cores extending through said baseplate and sealed therein by means of glass-to-metal seals;

a soft-magnetic reed contact fixedly attached at one end of each core, each reed contact in proximate relation with the corresponding reed contact of the other core of said pair of cores;

an electrical terminal connection member attached to each of said cores;

an electromagnetic coil proximate each core for inducing magnetism of one sense when electric current passes through said coil in one direction and for inducing magnetism of an opposite sense when electric current passes through said coil in a direction opposite to said first current direction, said bistable latching relay becomes operative when electric current passing through each of said electromagnetic coils induces magnetism of opposite sense within each of said remanent-magnetic cores, said magnetism being transmitted to said soft-magnetic reed contacts causing said contacts to come in contact with each other and magnetically coupled together, and when an electric current passes through said coils to induce magnetism of the same sense within said coils, said magnetism is transmitted to said reed contacts thereby causing said contacts to open under the magnetic repulsion existing therebetween said contacts.

3,869,685

SEALED CONTACT CAPABLE OF BEING MAGNETICALLY ACTUATED

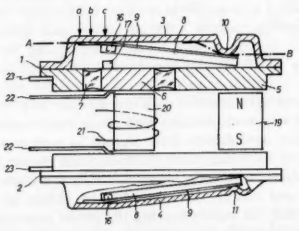
Helmut Buttel, Leonberg-Eltingen; Ingo Rudiger Isert, Bietigheim; Alfred Leicht, Stuttgart-N, and Albert Schach, Magstadt, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 24, 1974, Ser. No. 436,020

Claims priority, application Germany, Feb. 9, 1973, 2306522

Int. Cl. H01h *1/12*

U.S. Cl. 335—196 **3 Claims**



1. A sealed contact of the type capable of being magnetically actuated and having a flat base plate including an inner and outer part joined by a glass seal, a cover of predetermined shape sealed to the base plate, an armature holding spring fixedly attached to the cover wherein the improvement comprises an armature fixedly attached to the armature holding spring said armature having a wedge-shaped cross sectional recess along a part of its length on the surface of said armature adjoining the outer part of said base plate, said recess having a deepest edge toward the pivot point formed between said armature and said base plate, and gradually decreasing in depth toward the opposite end of said armature, whereby a voltage breakdown path is provided between said armature and said base plate.

3,869,686

SUPER-CONDUCTIVE COILS INCORPORATING INSULATION BETWEEN ADJACENT WINDING LAYERS HAVING A CONTRACTION RATE MATCHING THAT OF THE SUPER-CONDUCTIVE MATERIAL

Hans Benz, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 31, 1973, Ser. No. 411,219

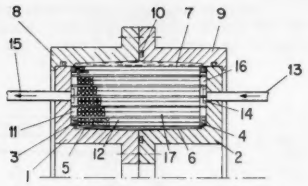
Claims priority, application Switzerland, Nov. 6, 1972, 16029/72

Int. Cl. H01f *7/22*

U.S. Cl. 335—216 **7 Claims**

1. A magnetic field-producing coil comprising a plurality of layers wound from a conductor made of super-conductive material, said coil being impregnated with a hardened synthetic and preferably epoxy resin, and containing a system of cooling ducts, there being disposed between adjacent winding layers a reinforcing fiber layer such as will form in conjunction with the impregnating resin a system free from eddy currents

and having a high degree of mechanical stability and which has a contraction rate at the operating temperature of the coil



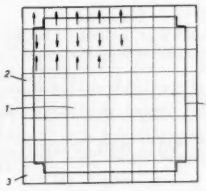
that matches the contraction rate of the super-conductive material.

3,869,687

BISTABLE CROSSPOINT MATRIX

Walter Hoffmann, Munklingen; Hans-Dieter Pfeil, Mainz, and Wolfgang Mecklenberg, Asperg, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,643
Claims priority, application Germany, Dec. 7, 1972, 2260002
Int. Cl. H01h *3/12*
U.S. Cl. 335—236 **4 Claims**



1. In a crosspoint matrix of the type having a plurality of electromagnetic relays arranged in rows and columns, each relay including an electromagnetic coil and a permanent magnet, wherein the improvement comprises:

a cover sheet in magnetic proximity to said plurality of relays for selectively shunting the magnetic fields of the permanent magnets by partially covering some of the magnets and completely covering the rest of the magnets within said matrix thereby eliminating variations in magnetic forces upon the contacts within said relays.

3,869,688

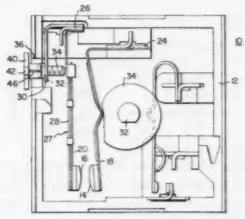
CUSTOMER ADJUSTMENT SWITCH ASSEMBLY

George C. Aldous, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 24, 1974, Ser. No. 436,282
Int. Cl. H01h *61/00*
U.S. Cl. 337—82 **9 Claims**

1. In an electric cooking apparatus comprising a surface heating unit supported on a counter member and including panel for supporting switch means associated with said unit, a thermal cycling switch enclosed in a housing mounted on the back face of said panel having a pair of opposed relatively movable contact carrying arms and a rotatable control shaft mounted with one end adjacent said arms and including means for controlling the closed position of said contacts, the opposite end of said shaft extending forwardly through said panel to be manually accessible for rotating said shaft between an "off" position and any various "on" positions to vary the energization time of said heating unit over a predetermined range in accordance with the closed position of said contacts for maintaining a relative cooking temperature identified by indicia associated with said position and wherein the improvement comprises:

switch calibration means for correlating, within limits, the relative temperature of said unit maintained at one of said positions of said shaft to the indicia relating to said position, said calibration means comprising means for adjusting the initial position of one contact with respect to the



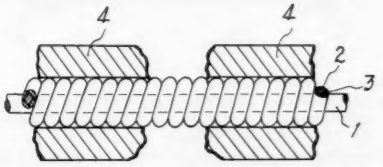
other, said adjusting means being incrementally movable and including a portion extending from adjacent one of said contact carrying arms to exteriorly of said switch housing, and forwardly through said panel for manual access for moving said adjusting means from the same side of said panel as the manual movement of said shaft, and abutment means for limiting the movement of said adjusting means.

3,869,689

TIME-DELAY FUSE ELEMENT

Mikizo Kasamatu, 22-7, Korikitano-cho, Neyagawa-Shi, Osaka, Japan

Filed Dec. 19, 1973, Ser. No. 426,135
Claims priority, application Japan, Dec. 26, 1972, 48-931
Int. Cl. H01h *85/12*
U.S. Cl. 337—164 **8 Claims**



1. A time-delay fuse element comprising at least two fusible electroconductive resistance wires, one of the resistance wires being coated with a meltable electrically insulating material, at least the coated resistance wire being helically wound around the other resistance wire to form a core wire constituted by the two resistance wires, and a fusible electroconductive resistance member covering the core wire and having a lower electric resistance than the core wire.

3,869,690

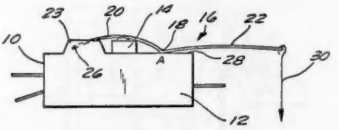
DOUBLE ACTING SNAP SWITCH

Colin D. Hickling, Woodstock, N.Y., assignor to American Thermostat Corporation, South Cairo, N.Y.

Filed Mar. 8, 1973, Ser. No. 339,367
Int. Cl. H01f *27/28*
U.S. Cl. 337—390 **5 Claims**

1. A double acting switch comprising a support having a surface, a pair of contacts mounted on said support and relatively movable with respect to each other between engaged and disengaged positions, actuating means movable relative to said support and operably connected to one of said contacts to move same between said engaged and disengaged positions, a resilient lever one end of which is pivotally mounted to said

support for movement between first, second and third positions, said lever being divided into first and second sections by a bend in said lever, said first section being defined by said one end and said bend, said first section engaging said actuating means to move same in accordance with the movement of said lever, said lever moving said actuating means such that said contact is in one of said contact positions when said lever is



in the first position, in the other of said contact positions when the lever is in said second position and moved back to said one of said contact positions when said lever is in the third position, said bend abutting said support surface when said lever is in said second position such that as said lever moves from said second to said third position said first section is deformed by said surface.

3,869,691

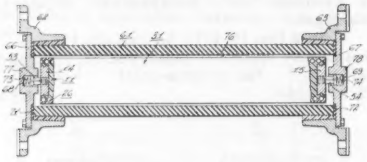
RESISTOR FOR POWER DISTRIBUTION CIRCUITS

Norman W. Stunkard, Lake Oswego, Oreg., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 6, 1974, Ser. No. 467,553

Int. Cl. H01c *1/00*

U.S. Cl. 338—231 **7 Claims**



1. An electrical resistor;

a cylindrical core of an epoxy material, said core having a spiral groove formed in its cylindrical surface and extending from end-to-end thereof;

a metallic end plug intimately secured in each end face of said epoxy core;

a resistor wire wound on said core in the spiral groove therein;

means to electrically connect the ends of said resistor wire to an adjacent metallic end plug;

a covering of epoxy material encapsulating said wire wound epoxy core, said covering having intimate bonding contact with the epoxy material of said core to form a unitary encapsulated resistor unit; and,

electrical contact means extending outwardly from each of said metallic end plates to provide connections to electrical contacts.

3,869,692

HEATER FOR VACUUM TUBE CATHODE IN WHICH THE WIRE OF THE HEATER LEGS HAS BEEN ETCHED TO REDUCE ITS DIAMETER

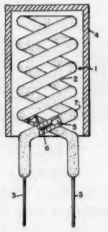
Robert C. Larson, Exeter, N.H., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed May 7, 1973, Ser. No. 358,016

Int. Cl. H01c *3/00;* **H01j** *1/22;* **H05b** *3/10*

U.S. Cl. 338—296 **1 Claim**

1. An insulatively coated wire-wound reverse helix heater comprising a single length of refractory metal wire, said heater having a coiled body portion and two legs, the legs longitudinally protruding substantially parallel to each other from one end of the body, the diameter of the wire in the legs being less



than the diameter of the wire in the body by means of having been etched in a suitable etching liquid.

3,869,693

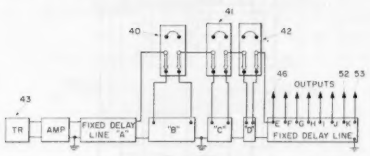
SCANNING ARRANGEMENT FOR SONAR BEAMS

Charles H. Jones, Murrysville, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 22, 1967, Ser. No. 686,379

Int. Cl. G01s *3/80*

U.S. Cl. 340—6 R **8 Claims**



1. In an underwater sound detecting system of the type wherein *m* vertically spaced, directional beams are scanned to detect wave fronts arriving at a receiving site at different arrival angles, the combination of

a multiplicity of equally spaced transducers, said transducers being arranged in a vertical line at said receiving site;

a similar multiplicity of delay lines, one end of each delay line being connected to a corresponding transducer whereby the signals produced by said transducers are sent down different delay lines,

said delay lines being of progressively shorter length with the delay line having the longest length being connected to the transducer at the top of said vertical line;

means for extracting said signals at various points along said delay lines so as to impart to said transducers a beam pattern which includes *m* equally spaced, vertical beams with said signals corresponding to the acoustic signals picked up by said m-beams; and

means for switching portions of each delay line into and out of its delay lines thereby to shift said directional beams by incremental amounts.

3,869,694

ULTRASONIC CONTROL APPARATUS FOR AN OCULOMETER

John Merchant, Needham, Mass., and Donald J. Rotier, St. Paul, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 26, 1973, Ser. No. 409,868

Int. Cl. G01s *3/80*

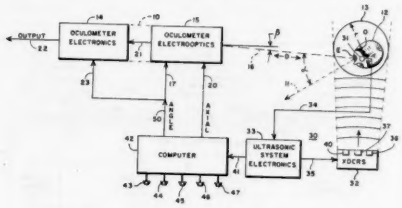
U.S. Cl. 340—16 R **6 Claims**

1. Apparatus for continuously giving an output representa-

tive of the direction of regard of an observer who is free to move and turn within an observation volume, including:

means carried in part by the observer for giving a first output representative of the coordinates of the observer's eye in a predetermined coordinate system;

optical means, including adjusting means for the focus thereof and for the angular direction of the optical axis



thereof about a known center, for giving a second output in accordance with deviation of the observer's direction of regard from the direction of said optical axis; and

means energized with said first output, and settable in accordance with the coordinates in said system of said known center, for adjusting one of said adjusting means in accordance with said first output.

3,869,695

WORN BRAKE LINING ALARM CIRCUIT

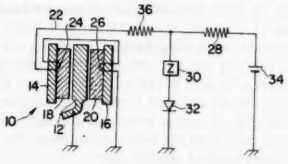
Yasuo Kita, Itami, Japan, assignor to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed July 20, 1973, Ser. No. 381,196

Claims priority, application Japan, July 24, 1972, 47-87572[U]

Int. Cl. B60t *17/22*

U.S. Cl. 340—52 A **4 Claims**



1. In combination with a worn brake-lining detector circuit of the type which is electrically interrupted when the lining wears down to a predetermined working limit, an improved alarm circuit for indicating the interruption comprising:

a. a D.C. power source,

b. voltage divider means connected to said power source,

c. a normally non-conducting two-terminal negative resistance diode coupled to said voltage divider means,

d. means connecting said detector circuit in shunt with said diode; whereby when said shunt-connected detector circuit is normally uninterrupted, the divided voltage applied to said diode by said voltage divider means is less than the threshold switching voltage, but greater than the holding voltage, of said diode; and

e. said D.C. power source having a terminal potential greater than or equal to the threshold switching voltage of said diode so that, when said detector circuit is interrupted even only momentarily, said terminal voltage is applied to said diode to render said diode conducting as an indication of the interruption, said diode remaining continuously conducting even if said detector circuit is subsequently closed.

3,869,696

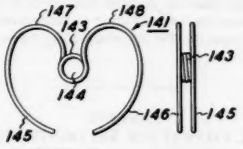
FUSER APPARATUS

Charles H. Snowden, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 250,671, May 5, 1972,. This application Sept. 20, 1973, Ser. No. 399,020

Int. Cl. F21v *21/00*

U.S. Cl. 240—52 R **4 Claims**



1. In apparatus wherein an elongated lamp is supported at each end by a support member within a lamp housing, an improved lamp support member comprising:

a convoluted central portion defining an aperture for receiving a lamp terminal and axially spaced oppositely curved arcuate outer portions connected to the axial ends of said central portion for supporting said lamp within said lamp housing.

3,869,697

PATTERN IDENTIFYING SYSTEMS

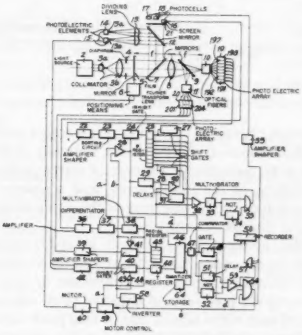
Harumi Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1973, Ser. No. 322,553

Claims priority, application Japan, Jan. 13, 1972, 47-5983

Int. Cl. G06k *9/12*

U.S. Cl. 340—146.3 P **2 Claims**



1. In a system for identifying two-dimensional patterns, positioning means for positioning a pattern which is to be identified at a reading location, optical means for forming a Fourier transformation image of a pattern at said reading location, said optical means having an optical axis extending through said reading location and having elements distributed along said optical axis before and behind said reading location, photosensitive means positioned with respect to said optical axis for receiving said Fourier transformation image and for detecting angular and radial components thereof, electrical converting means electrically connected with said photosensitive means for receiving an input therefrom formed by said components and for converting said components respectively into corresponding binary representations which form an output of said electrical converting means, and correlating means electrically connected to said electrical converting means for receiving said binary output therefrom and for

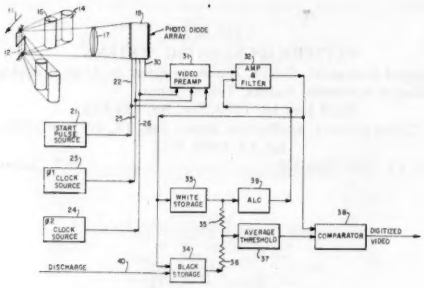
electronically correlating said output with reference binary representations to achieve therefrom a signal which identifies the pattern at said reading location, a differentiating means being optically connected with said optical means for differentiating between two parts of the pattern at said reading location prior to its formation into a Fourier transformation image, and electrical transmitting means electrically connected between said differentiating means and said correlating means for comparing the two parts and transmitting to the differentiating means an additional signal according to the difference between the light passing through two parts of the pattern at said reading location for providing at said correlating means an increased capacity for discriminating between different patterns.

3,869,698

OPTICAL CHARACTER RECOGNITION VIDEO AMPLIFIER AND DIGITIZER

Edward Trost, Philadelphia, and Clifford E. Martin, Lansdale, both of Pa., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,128
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 AG **6 Claims**



1. In optical character recognition apparatus including an array of photoconductive diodes for optically scanning the characters to be recognized, a source of start signals for starting the scanning of the diode array, and a source of clock signals for sequencing the scanning of the diode array; a video amplifier and digitizer comprising:

an amplifier connected to said diode array for receiving and amplifying the video signal from said diode array;

first and second storage means connected to said amplifier for storing the positive and negative peak values, respectively, of said video signal, one of said peak values corresponding to the light background of the characters to be recognized and the other peak value corresponding to the dark portions of the characters to be recognized;

means connected to said first and second storage means for deriving a threshold level between said positive peak value and said negative value;

comparison means responsive to said amplified video signal and said threshold level for producing a digitized output signal having a first level when said amplified video signal is more positive than said threshold level and a second level when said amplified video signal is more negative than said threshold level; and

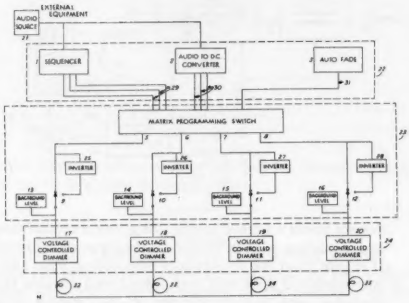
negative feedback means connected between the storage means storing said one peak value corresponding to the light background and said amplifier for stabilizing said one peak value of the amplified video signal, despite variations in the reflectivity of the light background of the characters to be recognized.

3,869,699

AUDIO RESPONSIVE APPARATUS FOR CREATING LIGHTING EFFECTS

John Jacob Haller, Boonton, N.J., and Lawrence Silverman, Ivorytown, Conn.

Filed May 16, 1973, Ser. No. 360,639
Int. Cl. G08b *5/36*
U.S. Cl. 340—148 **9 Claims**



1. An apparatus for creating lighting effects comprising:

a. means for generating a first plurality of low power electrical signals, includlng at least:

i. means for supplying audio signals; and first means responsive to said audio signals and having at least three output terminals, for generating first, second, and third low power electrical d-c signals at each of said terminals, respectively, in a predetermined sequence, and at a predetermined rate, said rate being controlled by the amplitude of said audio signals; and

ii. means for generating at least one low power electrical signal having a triangular waveform;

b. means for electrically coupling said low power electrical signals to said next-mentioned programable switching means;

c. programable switching means comprising in combination:

i. a plurality of input terminals corresponding on a one to one basis with said plurality of low power electrical signals electrically coupled from said generating means;

ii. a plurality of output terminals corresponding on a one to one basis with the below-mentioned plurality of lamp intensity control means; and

iii. means for electrically intercoupling said input terminals and said output terminals in a predetermined order;

d. a second plurality of lamp intensity control means, each having input terminal means, responsive solely to said low power electrical signals intercoupled to said output terminals; and

e. means for electrically coupling said output terminals to said input terminal means of said plurality of lamp intensity control means.

3,869,700

STORED VALUE SYSTEM

Kenneth Allen Cook, Pine Island, and Townsend Henry Porter, Jr., Rochester, both of Minn., assignors to International Business Machines Coporation, Armonk, N.Y.

Filed Dec. 26, 1972, Ser. No. 317,982
Int. Cl. G06k *7/08*
U.S. Cl. 340—149 A **6 Claims**

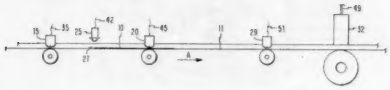
1. A stored value system comprising

a stored value card with a magnetizable layer on which digital signals are encoded on first and second portions and whereon said digital signals store a value balance,

said first portion having a security word encoded thereon and said second portion having a data word, including security data with a predetermined correspondence to said security word and said value balance, encoded thereon;

a device for processing said stored value card and including a document path along which said card is transported;

sensing means positioned adjacent said document path for sensing data encoded on said magnetizable layer;



compare means for comparing said security word encoded in said first portion with said security data encoded in said second portion to test for the presence of said predetermined correspondence;

encoding means positioned adjacent said document path subsequent to said sensing means for reencoding digital signals on said magnetizable layer when said test indicates the presence of said predetermined correspondence between said security words; and

control means for limiting operation of said encoding means to the period during which said magnetizable layer second portion progresses past said encoding means.

3,869,701

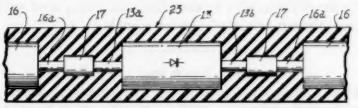
A PLURALITY OF ELECTRONIC ELEMENTS CONNECTED TOGETHER BY INTERCONNECTING WIRES AND CONNECTING JOINTS

Douglas G. Waltz, c/o Varo Semiconductor Inc., 1000 North Shiloh Rd., Richardson, Tex. 75040

Filed Mar. 2, 1972, Ser. No. 231,311

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—72 **2 Claims**



1. An electronic component assembly comprising: a plurality of axially aligned electronic elements of substantially the same cross-sectional area and similar electrical character, each having an elongated cylindrical body with lead wires extending from the respective ends thereof; interconnecting wires interjacent said lead wires, each of said interconnecting wires having a cross-sectional size and shape closely corresponding to that of said electronic elements; connecting joint means joining each of said lead wires to the adjacent end of a said interconnecting wire whereby to form said electronic elements into a serially connected chain; and a homogeneous elongated covering of electrical insulating material formed over said electronic elements, interconnecting wires and connecting joint means in intimate contact with substantially the entire outer surfaces thereof, said covering having a substantially uniform cross-sectional size throughout its length.

3,869,702

STUD MOUNT FOR LIGHT EMISSIVE SEMICONDUCTOR DEVICES

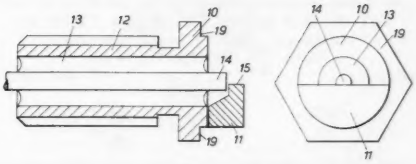
Geoffrey Howard Backhouse, Bishop Stortford, and Norman Derek Leggett, Hoddesdon, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 10, 1973, Ser. No. 404,968

Claims priority, application Great Britain, Jan. 30, 1973, 4683/73

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—74 **4 Claims**



1. A light emissive semiconductor device mount comprising:

a steel stud having a hole therein;

a hollow stem protruding from the opposite face of said stud;

a wire passing through said hollow stem and said hole providing the other connection for said semiconductor device;

means for electrically insulating said wire in said hollow stem; and

a substantially semi-cylindrical copper block secured to one face of said stud and having a recess therein spacing it away from the end of said wire, wherein said semiconductor device is secured to said copper block and lies on the common axis of said stud and said hollow stem, said block providing one terminal connection for said semiconductor device.

3,869,703

SEMICONDUCTOR DEVICE HAVING AN IMPROVED SUPPLY LEAD SUPPORT

Colin Michael Rowe, and Francis Rayner, both of Stockport, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 308,032, Nov. 20, 1972, abandoned, which is a continuation of Ser. No. 123,544, March 12, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,266

Claims priority, application Great Britain, Mar. 16, 1970, 12507/70

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—79 **14 Claims**

1. A semiconductor device comprising:

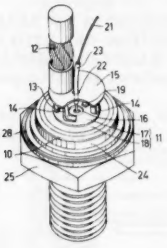
a. a semiconductor body comprising first and second major surfaces oppositely disposed to each other;

b. a first electrode disposed at said first major surface and a second electrode disposed at said second major surface

of said body, said semiconductor body containing a main current path between said first and second electrodes;

c. an interconnection member fixedly secured to said first electrode, said interconnection member comprising a metal strip extending alternately between two levels to form therebetween an open-sided structure having at each of the two levels plural discrete contact portions mutually spaced around the area at each respective level, said interconnection member being fixedly secured at said contact portions at one of said levels to said first electrode to form a mechanically stable structure and an electrical contact;

d. main current-carrying supply conductor fixedly secured at said interconnection member contact portions at the other of said levels to provide a main current connection



to said first electrode, said supply conductor being supported above said first electrode by said interconnection member;

e. an electrically and thermally conductive header member to which said semiconductor body is fixedly secured at said second electrode to provide a heat sink for said semiconductor body and to provide a main current connection to said second electrode; and

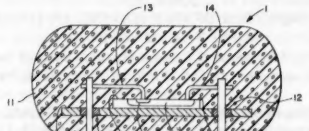
f. a thin metallized element disposed at said first surface of said semiconductor body, said first electrode comprising a flat metal plate that has first and second oppositely disposed major surfaces and that is fixedly secured at said first surface of said first electrode to said metallized element, said contact portions at said one level of said interconnection member being mounted on and fixedly secured to said second surface of said first electrode.

3,869,704

SEMICONDUCTOR DEVICE WITH DISPERSED GLASS GETTER LAYER

William L. Hunter, and Keith Gordon Spanjer, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 17, 1973, Ser. No. 398,909
Int. Cl. H01l *11/00*; H01l *15/00*
U.S. Cl. 357—54 **2 Claims**



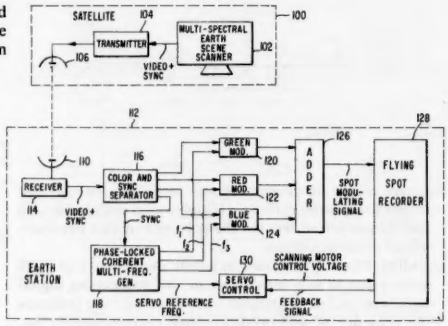
1. A semiconductor device having a body of semiconductor material having at least one region of P conductivity and a second conductivity of N conductivity type defining a P-N junction therebetween, having electrically conductive terminals extending therefrom, and having a closure member, the closure member surrounding the body of semiconductor material and being comprised of plastic having a phosphorous-doped finely divided glass filler.

3,869,705

ELECTRONIC TECHNIQUE FOR MAKING MULTICHANNEL, SPATIAL-CARRIER-ENCODED RECORDINGS

Dennis Joseph Woywood, Cherry Hill, N.J., and Stephen Leonard Corsover, Philadelphia, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 15, 1972, Ser. No. 289,356
Int. Cl. H04n *9/00*
U.S. Cl. 358—5 **9 Claims**



1. A multichannel recording system comprising a flying spot recorder, means for generating a number of separate coherent signals having predetermined relative frequencies with respect to each other including a coherent reference signal and a plurality of coherent carrier signals each of which is phase locked with said reference signal, means coupled to said recorder and having said reference signal applied thereto for line-scanning the flying spot of said recorder at a rate proportional to the frequency of and phase locked with said reference signal, said carrier signals each having a frequency which is higher than said line-scan rate and being characterized in that the respective quotients yielded by the division of the frequency of each respective carrier signal by said line-scan rate are different, modulation means for individually amplitude modulating each respective carrier signal with a separate applied channel information signal, and means for applying said amplitude-modulated carrier signals to said recorder for simultaneously intensity modulating said flying spot with all of said amplitude-modulated carrier signals.

3,869,706

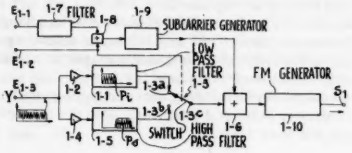
SYSTEM FOR CONVERTING TELEVISION SIGNALS INTO ANGLE MODULATED CARRIER WAVEFORMS OF REDUCED BANDWIDTH AND VICE-VERSA

Jean Paul Peltier, Paris, France, assignor to Thomson - CSF, Paris, France

Filed June 7, 1973, Ser. No. 368,048
Claims priority, application France, June 13, 1972, 72.21163
Int. Cl. H04n *5/40*, *5/44*
U.S. Cl. 358—12 **18 Claims**

1. A method for converting television signals into multiplexed signals constituted by an angle modulated carrier waveform of reduced bandwidth, said method comprising the steps of: splitting said television signals into first and second distinct frequency bands respectively alloted to the transmission of first and second television signal components carrying together the video-frequency information pertaining to said television signals, partitioning each of said first and second television signal components into slices in accordance with a sequence of time intervals substantially equal to the line scanning duration of said television signals, selecting without delay

half of said slices for forming a time multiplexed sequence of slices wherein a slice of said first television signal component corresponding to a predetermined line in one field is immediately followed by a slice of said second television signal component corresponding to the next line in said field, and angle modulating a carrier waveform with said time multiplexed sequence of slices; said method, for simultaneously processing the audio frequency information associated with the television



image, further comprising the step of continuously modulating said carrier waveform with a further modulated subcarrier waveform carrying said audio-frequency information and the line synchronization signals of said video-frequency information.

8. A method as claimed in claim **7**, wherein the separation from one another of said first and second television signal components is performed by filtering the demodulated carrier waveform in each of said angle demodulating channels.

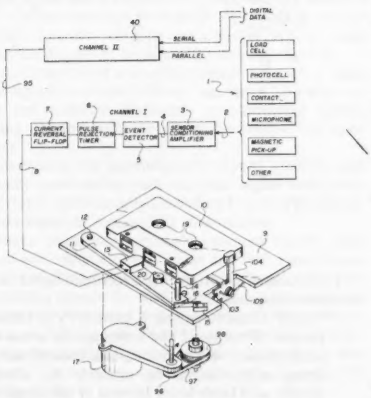
3,869,707
EVENT LOGGING SYSTEM USING A MAGNETIC RECORDER

Frederick B. Cupp, Fairport, N.Y., assignor to Edmac Associates Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 246,270, April 21, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 396,013

Int. Cl. G11b *5/00*

U.S. Cl. 360—5 **7 Claims**



1. In an event logging system for recording digital data representative of events and including means for receiving a cassette including a continuously movable magnetic tape having recording track, the combination comprising:

a. actuable first channel means including a head and an analog circuit adapted to convert analog information into a format suitable for magnetic recording by said head, said channel means being effective when actuated for recording events on the track of said tape; said first channel means including:

i. an event detector for producing electrical signals representative of events respectively;

ii. a pulse rejector timer circuit coupled to said event detector for passing only one of said event signals for one detected event; and

iii. a current reversal flip-flop coupled to said head and said timer circuit and responsive to the one processed event signal by said timer circuit to change the flip-flop state and record the one event;

b. switch means effective when moved to an operative position for actuating said channel means to cause said system to record data.

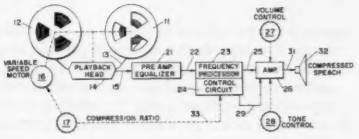
3,869,708
SPEECH COMPRESSOR WITH GAP FILLING

Murray M. Schiffman, Westport, Conn., assignor to Cambridge Research and Development Group, Westport, Conn.; Sanford D. Greenberg, Washington, D.C.; DT Liquidating Partnership, New York, N.Y. and Murray M. Shiffman, Westport, Conn.

Continuation-in-part of Ser. No. 331,550, Feb. 12, 1973, Pat. No. 3,828,361, which is a continuation-in-part of Ser. No. 171,571, Aug. 13, 1971, Pat. No. 3,786,195. This application Jan. 14, 1974, Ser. No. 430,911

Int. Cl. G11b *5/00, 15/18, 19/28*

U.S. Cl. 360—8 **6 Claims**



1. A sound reproducer for playing a sound record at playback speed different than its recorded speed comprising means for transporting said sound record at a selected playback speed relative to a transducer to obtain an electric signal having frequency components altered by the ratio of said playback speed to said recorded speed;

means for frequency converting said electric signal with a repetitive varying time delay function having time delay variation adjusted in response to selection of said playback speed to be a function of $C-1/C+1$ where C is said ratio of said playback speed to recorded speed;

means responsive to adjusting said delay variation for varying the repetitive interval of variation for said delay function approximately in direct relation to $C+1/C-1$ for all values of C; and

utilization means for the portions of said electric signal which have been frequency converted by said varying time delay function operable to produce a substantially continuous output signal.

3,869,709
MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS HAVING ROTARY HEADS WITH STILL MODE OF OPERATION

Jin Yamagishi, Tokyo, and Hiroaki Momiyama, Fujimi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 28, 1973, Ser. No. 401,822

Claims priority, application Japan, Sept. 29, 1972, 47-114004

Int. Cl. H04n *5/78*; **G11b** *21/02, 15/18*

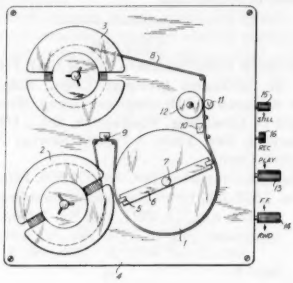
U.S. Cl. 360—10 **20 Claims**

1. In a magnetic recording and/or reproducing device having a rotary magnetic recording/reproducing head and a tape guide drum about which is wrapped a run of movable magnetic tape, the rotary magnetic head scanning the run of magnetic tape in skewed relation thereto to record information on the magnetic tape or reproduce information from the mag-

netic tape; apparatus for controlling the rotary head, comprising:

driving means for rotating the rotary magnetic head;

mode changing means for selectively changing the mode of operation of the magnetic recording and/or reproducing device between a normal reproducing mode wherein the magnetic tape moves and the rotary magnetic head moves relative to the tape and a still reproducing mode wherein plural reproductions of the information recorded on a limited portion of the magnetic tape are made;



tape run control means responsive to said mode changing means for stopping the movement of said magnetic tape when the mode of operation of the magnetic recording and/or reproducing device is changed from a normal reproducing mode to a still reproducing mode; and

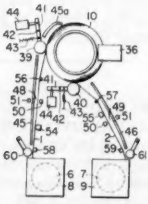
drive control means coupled to said driving means for controlling the rotating speed of the rotary magnetic head for each of said modes of operation of the magnetic recording and/or reproducing device such that a first rotating speed at which said rotary magnetic head is driven during a normal reproducing mode of operation is changed to a second rotating speed during a still reproducing mode of operation.

3,869,710

MAGNETIC TAPE DUPLICATING DEVICE

Sinichi Harazono, Katano, and Toshinori Morikawa, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 7, 1973, Ser. No. 386,340
Claims priority, application Japan, Aug. 16, 1972, 47-81921
Int. Cl. G11b *5/86, 15/66;* **B65h** *75/28*
U.S. Cl. 360—17 **8 Claims**



1. A magnetic tape duplicating device comprising:

a master reel on which a master tape is wound;

a slave reel on which a slave tape is wound;

leader tapes affixed to the respective leading ends of said master and slave tapes;

an inner take-up reel on which both said leader tapes are wound;

an outer take-up reel on which both said master and slave tapes following the leader tapes are wound, said outer take-up reel being disposed around said inner reel substantially concentric therewith with a space defined therebetween for permitting both said leader tapes to be wound on said inner reel;

opening means provided to said outer reel through which both said leader tapes pass from the outside of said outer reel to said inner reel;

first means for independently rotatably driving said inner and outer reels;

second means for joining and rotatably driving said inner and outer reels together;

a transferring magnetic field generator for applying a transferring magnetic field to both tapes wound up on said outer reel with their respective magnetic surfaces contacted with each other; and

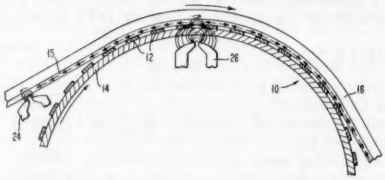
a rewind means for winding back the tapes wound up on the respective outer and inner reels onto the respective master and slave reels.

3,869,711

MAGNETIC PATTERN RECORDING

William R. Bernard, and Walter S. Buslik, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 399,902, Sept. 24, 1973, abandoned.
This application Jan. 25, 1974, Ser. No. 436,765
Int. Cl. G11b *5/86*
U.S. Cl. 360—17 **7 Claims**



1. Apparatus for producing a recorded signal on a magnetic medium comprising:

a master element having a permanently formed physical pattern of magnetic and nonmagnetic areas of lands and voids respectively on one surface thereof, said pattern not being magnetizable or erasable by electromagnetic means, said lands being formed of soft magnetic material having high permeability and low coercivity and disposed over a nonmagnetic base;

means for moving said medium in unison with said master element with substantially no relative motion between said medium and said element, while said element and said medium are maintained in close transducing relation;

a magnetic head positioned adjacent to a surface of said master element opposite to said one surface, so that said element is between said medium and said magnetic head, for providing a constant DC field to effectively record on said medium pattern of signals corresponding to said physical pattern.

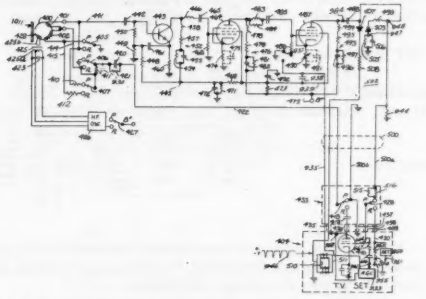
3,869,712
VIDEO PLAYBACK SYSTEM WITH FLUTTER TOLERANT CLAMPING

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation of Ser. No. 200,793, Nov. 22, 1971, abandoned, division of Ser. No. 848,992, Aug. 11, 1969, abandoned, and Ser. No. 62,601, Aug. 10, 1970, Pat. No. 3,683,107, said Ser. No. 848,992, which is a division of Ser. No. 401,832, Oct. 6, 1964, Pat. No. 3,495,046, said Ser. No. 62,601, which is a continuation of Ser. No. 528,934, Feb. 21, 1966, abandoned, is a continuation-in-part of Ser. No. 393,282, Aug. 31, 1964, Pat. No. 3,506,780, continuation-in-part of Ser. No. 401,832, and Ser. No. 407,402, and Ser. No. 493,271. This application June 18, 1973, Ser. No. 370,640

Int. Cl. H04n *5/78*

U.S. Cl. 360—33 **3 Claims**



1. In a transducer system including a broadcast television receiver having a horizontal deflection circuit for generating an output horizontal sweep frequency signal, a horizontal control circuit for controlling the frequency of said horizontal deflection circuit, a picture signal circuit for transmitting a video picture signal, and a video display unit having a horizontal sweep connected with said horizontal deflection circuit and having a video intensity control connected with said video signal circuit for display of a picture transmitted thereto,

a record medium having a recorded signal comprising video picture signals occurring during successive line scan intervals and periodic horizontal synchronizing signals occurring at the beginning of the respective line scan intervals,

a playback system for scanning said record medium and electrically reproducing said recorded signal with a degree of flutter substantially exceeding that of a broadcast television signal as received by said receiver,

circuit means connected with said playback system, and with said horizontal control circuit and with said picture signal circuit, for transmitting the reproduced horizontal synchronizing signals to said horizontal control circuit such that the horizontal sweep of the display unit responds to and follows the flutter in the reproduced horizontal synchronizing signals, and for transmitting the reproduced video picture signal to the intensity control of the display unit.

wherein the improvement comprises

said circuit means including an output circuit point and a coupling capacitor for coupling the output of the playback system with the picture signal circuit via said output circuit point and a shunt clamping circuit connected with said output circuit point for controlling the direct current potential at said output circuit point at the beginning of each line scan interval,

the clamping circuit including a first branch connected between said horizontal deflection circuit and said output circuit point for supplying a clamping pulse of predetermined duration from said horizontal deflection circuit to said output circuit point at the beginning of each line scan interval, and a second branch connected with said output circuit point and comprising a diode and potential establishing means in series for establishing a reference potential at said output circuit point in response to each of said clamping pulses, and

said first branch having series resistance therein of substantial value to control the degree of clamping action.

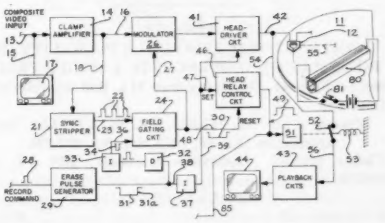
3,869,713
SINGLE FIELD VIDEO RECORDING SYSTEM AND METHOD

Robert C. Owens, Jr., Palos Verdes Peninsula, Calif., assignor to VAS Ltd., Torrance, Calif.

Filed Nov. 29, 1972, Ser. No. 310,668

Int. Cl. H04n *5/78*

U.S. Cl. 360—35 **10 Claims**



1. In a single field video recording system of a type employing a magnetic transducer element and a rotating record disc disposed in recording relation thereto for recording signals from a source of composite video signals of a type containing synchronizing timing signals occurring at regular intervals to define a field of video signals therebetween, means forming an erase pulse coupled to said transducer for a predetermined period of time in excess of the period of one revolution of said disc and serving to erase said disc throughout a closed circular path thereof, means deriving a control signal from a portion of said erase pulse, gating control means disposed to sense said timing signals and said control signal and serving to gate composite video signals from said source to said transducer element for recording upon said disc in said path in response to sensing of the first and said timing signals occurring after termination of said erase pulse and serving to inhibit said gating in response to sensing a second of said timing signals.

3,869,714
METHOD AND APPARATUS FOR CONTROLLING THE RISETIME OF A DIGITAL MAGNETIC RECORDING WAVEFORM

Richard C. Schneider, Longmont, and Lawrence Viele, Jr., Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,864

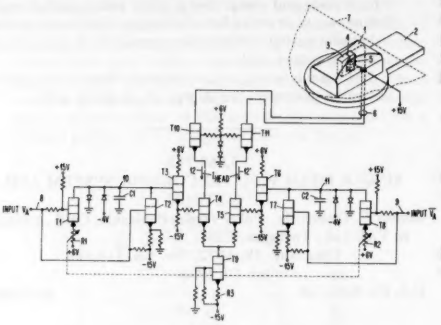
Int. Cl. G11b *5/09*

U.S. Cl. 360—45 **13 Claims**

1. In a magnetic recording system wherein digital signals represented as binary electric recording current are applied to a magnetic transducer which produces a corresponding magnetic field for recording saturated binary magnetization patterns on a magnetic medium, said recording current including: a first half-cycle having a first polarity, a shallow leading edge

and a relatively steep trailing edge; and

a second half-cycle immediately following the first half-



cycle, having a polarity opposite the first polarity, a shallow leading edge and a relatively steep trailing edge.

3,869,715

DIGITAL STORAGE HAVING A PLURALITY OF INFORMATION SEQUENCES IN A SINGLE TRACK

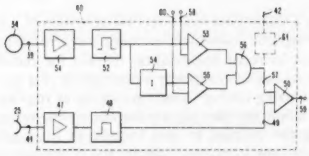
Klaus Schlickeiser, Webkrenzstrab 212, Boll near Hechingen, Germany

Division of Ser. No. 162,083, Pat. No. 3,772,664. This application Oct. 18, 1973, Ser. No. 407,596

Claims priority, application Germany, July 14, 1970, 2034836

Int. Cl. G11b *5/09*

U.S. Cl. 360—48 **8 Claims**



1. In a digital storage arrangement having elongated signal carrier means having a first and second track and having a first and second information sequence, each of said information sequences having a plurality of characters, each of said characters having a plurality of bits, stored on said first track bit serially and in character-interlaced form, and wherein each of said characters occupies a determined character length along said first track, said elongated signal carrier means further having a second track having a plurality of markings for indicating the beginning and end of each of said characters of said first information sequence, a read-out system for selectively reading out said first or said second information sequence, comprising, in combination, read-out means positioned in operative proximity of said first track for sensing said recorded first and second information sequences and furnishing corresponding information signals; externally operable selection means for furnishing a first selection signal indicating desired read-out of said first information sequence or a second selection signal indicating desired read-out of said second information sequence; sensing means positioned in operative proximity to said second track for sensing said markings on said second track and furnishing first marking signals, each present throughout the read-out of a character of said first information sequence, in response thereto; and control circuit means having a first input connected to said read-out means, a second input connected to said sensing means, a control input connected to said selection means, and a data transmission output, for transmitting signals from said read-out means to said data transmission terminal only in the simultaneous presence of said first marking signals and said first selection signal or in the absence of said first marking signal and the presence of said second selection signal.

3,869,716

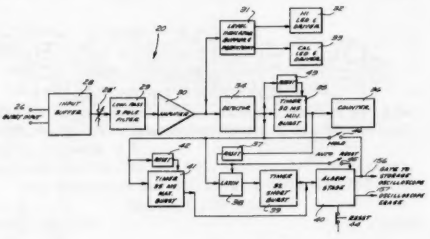
APPARATUS FOR QUALIFYING RECORDED TONE BURSTS

William M. Blethen, East Brunswick, N.J., assignor to Retention Communication Systems, Inc., New York, N.Y.

Filed Mar. 16, 1973, Ser. No. 341,946

Int. Cl. G11b *5/02;* **H03b** *3/04;* **H03k** *5/20*

U.S. Cl. 360—55 **1 Claim**



1. Apparatus for qualifying recorded tone bursts for a predetermined desirable amplitude, frequency specification, and duration on tape recordings comprising:

connection means for connecting the apparatus to a tape player containing a tape with the recorded tone bursts thereon so that the bursts from the tape are received in sequence by the apparatus;

a buffer stage means in the apparatus to receive each tone burst and provide high input impedance to the tone burst and having control means thereon to adjust the output thereof;

a low-pass filter means connected to said buffer stage means and tuned to accept the upper frequency specification of the tone burst;

an amplifier means connected to the filter means to make up for the low-pass filter means losses and to tailor the low frequency limit of the tone burst specification;

a detector means connected to the amplifier means and sensitive to the burst signal frequency created by the low-pass filter means and the amplifier means to supply an output voltage;

first and second timer means connected to said detector means and providing an output responsive to the presence of said output voltage for their time out periods;

the first timer means being set to time out at the predetermined minimum acceptable burst duration and the second timer means set to time out at the predetermined maximum acceptable burst duration;

the first timer means having adjustment means for varying the time out period;

a counter means connected to the first timing means whereby when the voltage supplied by the detector means is of sufficient duration for the first timer means to time out and provide said output it will trigger the counter means by one count thereby indicating the burst is of minimum amplitude, within a proper frequency range and of minimum duration;

reset means connected to the first timer means for resetting said first timer means when a burst duration or amplitude is not sufficient for the timer to time out;

reset means connected to the second timer means for resetting said second timer means when a burst duration or amplitude is not sufficient for the timer to time out;

a latch circuit means interconnected with the detector means for latching on responsive to said output voltage; latch reset means for resetting said latch means responsive to the timing out of either said first or second timer means;

a third timer means interconnected with the latch circuit means and set to time out at a predetermined time less than the predetermined minimum acceptable burst duration and providing an output responsive to said latch means being latched on for said predetermined time less than the predetermined minimum acceptable burst duration; and

the alarm stage means for producing a signal responsive to said output of either said second or third timer means.

3,869,717

MAGNETIC RECORDING AND REPRODUCING APPARATUS FOR MULTI-CHANNEL ENDLESS TAPE

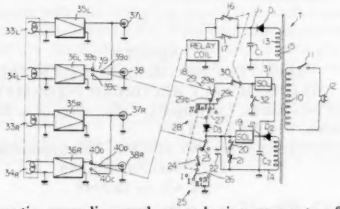
Toshio Kawada; Tadashi Torama, and Tamio Kobayashi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 260,401, abandoned. This application Feb. 6, 1974, Ser. No. 439,852

Claims priority, application Japan, June 18, 1971, 46-44346; June 18, 1971, 46-44347; June 18, 1971, 46-44348; June 18, 1971, 46-44349; June 18, 1971, 46-44350

Int. Cl. G11b *15/04, 23/04, 21/02*

U.S. Cl. 360—60 **4 Claims**



1. Magnetic recording and reproducing apparatus for 2-channel 4-channel endless tape in the form of a cartridge which comprises;

first actuating means (**18**) for exchanging 2-channel 4-channel output,

a cassette detection switch **17** selectively operated in accordance with an outer shape of the cassette to be used for controlling operation of said first actuating means,

a plurality of integrated recording switches (**16, 30, 21**) connected in parallel with said switch for controlling said actuating means and for controlling recording operation, a pair of 2-channel 4-channel switching means (**39, 40**) provided on the output of head output amplifiers and responsive to said switching means so as to supply either 2-channel or 4-channel output,

sensing switch means (**22**) provided in the vicinity of a head mechanism for detecting passage of conductive piece attached at the ends of the tracks of the tape,

second actuating means **19** coupled to said head mechanism for moving said head mechanism responsive to said sensing means,

a pair of rotary switch means (**25, 28**) coupled to said second actuating means for performing predetermined modes of operation of the apparatus in cooperation with the condition of sensing switch so as to automatically eject cartridge at the end of either 2-channel or 4-channel tracks, and

third actuating means (**31**) connected to the input of said second actuating means for ejecting the cartridge when actuated, whereby either 4-channel or 2-channel cartridge is automatically ejected at the end of the second program or at the end of the fourth program operation by the detection of the conductive piece thereby preventing double recording.

3,869,718

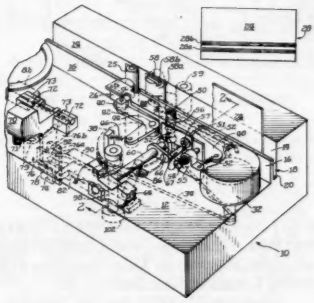
INTERLOCK MEANS RESPONSIVE TO TRACK SELECTION

Josef Schmidt, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 6, 1973, Ser. No. 367,513

Int. Cl. G11b *15/04, 19/04*

U.S. Cl. 360—60 **11 Claims**



1. An apparatus for handling generally planar cards carrying an elongated magnetic media having plural parallel recording tracks comprising: magnetic transducer head means;

drive means for moving a card across said head means;

circuit means coupled to said head means for providing recording and playback of audio information from the magnetic media on the card;

first manually operable means connected to said circuit means for selecting either the recording or playback function;

second manually operable means for moving said head means with respect to the card between first and second positions for transducing first and second sound tracks on the card; and

means mechanically coupling said first manually operable means to said second manually operable means to prevent actuation of said first manually operable means to select the recording function in response to said second manually operable means being disposed in said first position.

3,869,719

AUTOMATIC SEQUENCE CONTROL FOR REPRODUCING APPARATUS

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Filed Mar. 23, 1973, Ser. No. 344,180

Int. Cl. G11b *15/48, 15/02*

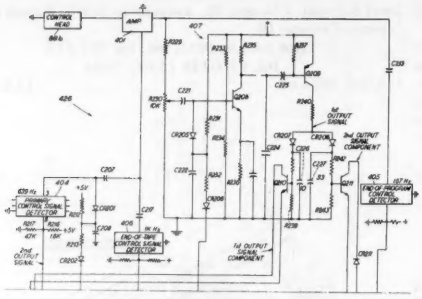
U.S. Cl. 360—72 **32 Claims**

1. In reproducing apparatus for a magnetic tape having discrete program-identifying control signals at intervals therealong, tape drive means for moving said tape past a transducing head, automatic sequence control means comprising:

a detector connected to said transducing head including means for detecting a control signal when the tape is moved past it;

tape drive control means including stop means for deenergizing said tape drive means to stop said tape in response to detection of a control signal, and means responsive to energization of said tape drive means to initiate tape

movement for disabling said stop means for sufficient time period to enable the tape to move, beyond said head, a residual control signal at which movement of the tape was initiated.



3,869,720

DICTATOR-TRANSCRIBER INDEXING SYSTEM

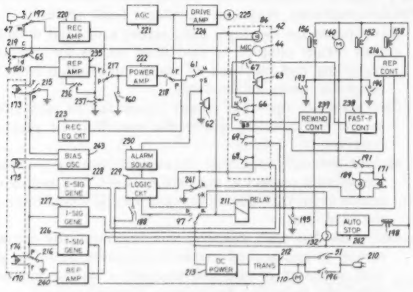
Tsunehisa Ohira, Sagamihara, and Tohru Takahashi, Tokyo, both of Japan, assignors to Victor Company of Japan Ltd., Yokohama, Kanagawa-Ken, Japan

Filed July 25, 1973, Ser. No. 382,384

Claims priority, application Japan, July 25, 1972, 47-74321

Int. Cl. G11b *15/18, 9/02, 5/48*

U.S. Cl. 360—72 **6 Claims**



1. A dictator-transcriber indexing system comprising a dictator and a transcriber, said dictator comprising:

first means for moving a recording medium in a first direction at a predetermined speed;

a recording and/or reproducing head;

first means for recording dictation message signals through said recording and/or reproducing head on a first track of the recording medium moving at said predetermined speed;

means for producing a first control signal which is continuously generated during the period in which said first recording means is in its recording mode of operation;

means for producing a second control signals at the instants of starting and/or completion of the recording of separate messages in said recording mode of said first recording means;

means for producing a third control signal for indicating instruction marks;

second means for recording said first, second and third control signals through said recording and/or reproducing head on a second track of the recording medium moving at said predetermined speed;

said transcriber comprising:

a reproducing head;

said first means for moving said recording medium in said first direction at said predetermined speed;

first reproducing means for reproducing said dictation message signals through said reproducing head from the recording medium moving at said predetermined speed in said first direction;

second means for moving said recording medium in a second direction opposite to said first direction at a higher speed than said predetermined speed;

said reproducing means for reproducing said recorded control signals through said reproducing head from said recording medium moving at said higher speed in said second direction, including means for contacting said reproducing head with the recording medium with a pressure lighter than the pressure with which said reproducing head contacts said recording medium during the operation of said first reproducing means;

means for individually separating said first, second and third control signals from the output signal of said second reproducing means;

an indication medium;

means for moving said indication medium in relation to the travel of said recording medium;

means responsive to the separated second control signal for imprinting a first mark on a first track of the moving indication medium;

means responsive to the separated third control signal for imprinting a second mark on a second track of the moving indication medium.

3,869,721

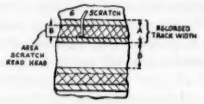
RECOVERY OF NORMALLY ILLEGIBLE, MAGNETICALLY RECORDED INFORMATION

Peter Bela Korda, Los Angeles, Calif., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 659,366. This application Oct. 5, 1973, Ser. No. 403,899

Int. Cl. G11b *5/43*

U.S. Cl. 360—77 **7 Claims**



1. In a system for reading a relatively wide record track on a record medium with a relatively narrow read head located at the approximate center of the track by creating relative movement between the record medium and head, in the track direction, in combination:

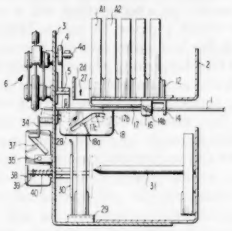
error detection means responsive to the information read by the read head for detecting an error; and

means responsive to an error detected by the error detection means for creating relative movement between the read head and track in a direction transverse to the track, and in an amount such that the head is still over the same track, but relatively closer to an edge portion thereof than the head was in its original position, and for again creating relative movement between at least the portion of the record medium containing the error and the head, in the track direction.

3,869,722
AUTO CASSETTE CHANGER

Tadahisa Iwasaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Ohta-Ku, Tokyo, Japan

Filed Oct. 26, 1972, Ser. No. 300,951
Claims priority, application Japan, Oct. 26, 1971, 46-84954; Oct. 26, 1971, 46-99413; Oct. 26, 1971, 46-99414
Int. Cl. G11b *23/12*
U.S. Cl. 360—92 **3 Claims**

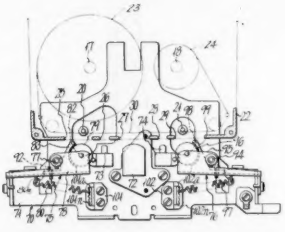


1. An automatic cassette changer device comprising a chassis, a tape drive mechanism secured to said chassis, cassette table means movably mounted on said chassis for holding a plurality of tape cassettes, pusher means for shifting said cassettes toward said tape drive mechanism for engagement of a first cassette with said tape drive mechanism, shift means for moving said table means away from said tape drive mechanism, aperture means formed in said table means and said chassis permitting the downward passage of the first cassette upon shifting of said table means away from said tape drive mechanism, platform means disposed beneath said aperture means for receiving a dropped cassette thereon and means for selectively holding and releasing the remaining cassettes during and subsequent to the dropping operation of a cassette.

3,869,723
MAGNETIC RECORDING AND REPRODUCING APPARATUS HAVING DUAL CAPSTANS FOR USE WITH CASSETTES

Kenji Yoshida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 2, 1972, Ser. No. 259,024
Claims priority, application Japan, June 7, 1971, 46-47868
Int. Cl. G11b *15/29, 5/54, 23/04*
U.S. Cl. 360—96 **17 Claims**

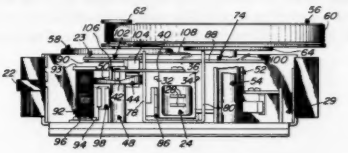


1. An apparatus for magnetically recording and reproducing signals on a magnetic tape, comprising simultaneously operative, spaced apart first and second drive means for transporting the tape at least in the direction from said first drive means to said second drive means in a path having a portion extending between said first and second drive means, each of said drive means including a rotated drive shaft and a pinch roller carried by a movable mounting means for movement against the respective drive shaft with the tape therebetween, at least one magnetic recording head means and at least one magnetic reproducing head means engageable with the tape at spaced locations along said portion of the tape path for respectively recording and reproducing signals on the tape during the transport thereof by said first and second drive means, and at least one magnetic erasing head means carried by said mounting means for the pinch roller of said first drive means and being disposed adjacent said pinch roller of the first drive means at the side of the latter away from said second drive means for engaging the tape simultaneously with said movement of the adjacent pinch roller against said respective drive shaft.

3,869,724
MAGNETIC TAPE HEAD INDEXING ASSEMBLY FOR A CARTRIDGE TAPE PLAYER

Edwin S. Bara, Chicago, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Jan. 23, 1974, Ser. No. 436,001
Int. Cl. G11b *21/08, 5/56*
U.S. Cl. 360—106 **11 Claims**



1. A magnetic tape head indexing assembly for use in a cartridge tape player including a magnetic tape head mounted for movement with respect to the various recording tracks on a magnetic tape in a cartridge received in the player, a rotatably mounted capstan for driving the tape through said cartridge and a flywheel mounted on said capstan for rotation therewith, said flywheel imparting rotatable movement to said capstan, said tape head indexing assembly including in combination: a rotatable cam including a plurality of cam surfaces, each of which corresponds to one of the recording tracks on said tape, said cam being coactable with said tape head for moving the latter to different positions with respect to said tape tracks in accordance with the rotation of said cam, a lever arm mounted adjacent said tape head for pivotal and longitudinal movement, one end of said lever arm being positioned adjacent said rotatable cam for engagement therewith, the opposite end of said lever arm being positioned adjacent said flywheel for engagement therewith, and actuator means opperable to pivot said lever arm from a first, normal position to a second, actuated position whereby said opposite end thereof engages said rotating flywheel, the force provided by said flywheel driving said lever arm longitudinally from a first position to a second position so that said one end engages said cam to rotate the latter for repositioning said tape head.

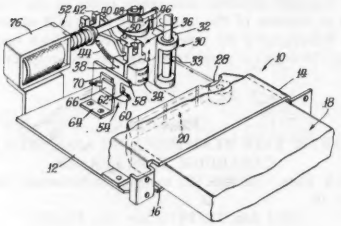
3,869,725
COMBINATION END OF TAPE SENSOR AND TAPE GUIDE DEVICE

Donald J. Dattilo, Mount Prospect, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 17, 1973, Ser. No. 398,117
Int. Cl. G11b *15/60, 21/08*
U.S. Cl. 360—130 **3 Claims**

1. In a cartridge tape player including a tape deck portion forming a cartridge receiving cavity wherein a tape cartridge is received for playback including a multi-track tape mounted therein for movement through the cartridge, said tape having a predetermined current conducting area indicating the end of said tape tracks, a magnetic tape head mounted in communication with said cartridge receiving cavity for engagement with the tape provided in a cartridge received in the cavity,

tape head indexing means for positioning said tape head with respect to the various tracks on said tape and circuit means for operating said tape head indexing means, a combination end of tape sensor and tape guide mounted on said tape player in

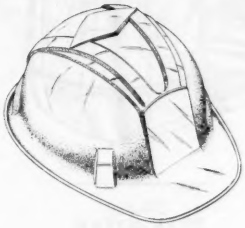


communication with said cartridge receiving cavity adjacent said tape head for contacting engagement with the tape provided in a cartridge received in said cavity, including in combination: a first electrode mounted in said tape player and having a major surface portion in a first plane, said major surface portion including a pair of parallel arms extending outward toward said tape cartridge, said arms spaced from each other predeterminedly and connected by a supporting portion to permit said tape to pass therebetween for engaging the tape in said cartridge between said arms to guide said tape past said tape head in alignment therewith, said supporting portion between said arms comprising the area of electrical contact between said first electrode and said current conducting tape area, a second electrode mechanically mounted to said first electrode and having an end portion and a major surface portion located within a plane all points of which are in a spaced relation to the first plane, said end portion being generally aligned with said supporting portion of said first electrode so that both said end portion and said supporting portion will be in contacting relation with the surface of said tape when said cartridge is fully inserted into said player and said tape is being driven therethrough, and insulating means provided between said first and second electrodes for electrically insulating the respective electrodes from one another as well as maintaining the electrodes in said spaced relation, said first and second electrodes being connected to said circuit means for actuation thereof upon simultaneously contacting said predetermined current conducting tape area for repositioning said tape head with respect to said tape.

DESIGNS

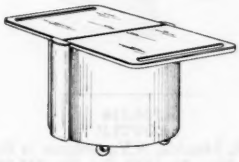
MARCH 4, 1975

234,411
SAFETY HAT OR SIMILAR ARTICLE
Horace E. Zuppert, Shaker Heights, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed July 23, 1973, Ser. No. 381,899
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—231



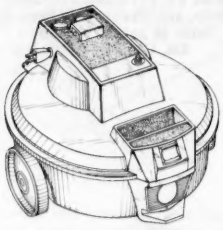
234,412
PENDANT PULL FOR A SLIDE FASTENER
Allan O. Swan, Meadville, Pa., assignor to Textron Inc., Providence, R.I.
Filed Jan. 29, 1973, Ser. No. 327,531
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—415

234,413
COMBINED PORTABLE BAR, TABLE AND MAGAZINE RACK
Carlo Hauner, Mompiano, Italy, assignor to Fanini Fain S.p.A., Aprutina, Italy
Filed Mar. 16, 1973, Ser. No. 341,917
Claims priority, application Italy Sept. 23, 1972
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—4



234,414
FOLDING CHAIR
Yvon Becquet, La Rochelle, France, assignor to Societe SO-GE-MA-P, La Rochelle, France
Filed June 15, 1973, Ser. No. 370,406
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

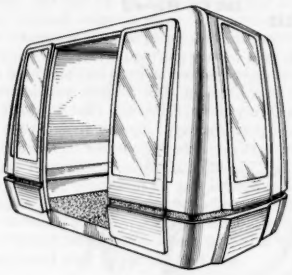
234,415
CANISTER VACUUM CLEANER
Stephen K. Lauderback, Elmhurst, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed July 5, 1973, Ser. No. 376,771
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—166

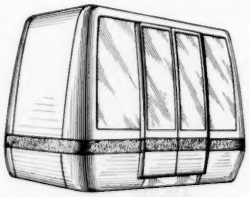


234,416
BOTTLE
Albert Skolnik, Merrick, N.Y., assignor to Revlon, Inc.
Filed Mar. 28, 1973, Ser. No. 345,552
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—54

234,417
COOKING POUCH
Lester E. Bair, Brownsville, Tex., assignor to Fairshare Marketing & Manufacturing Co., Inc., Brownsville, Tex.
Filed July 3, 1972, Ser. No. 268,523
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—249

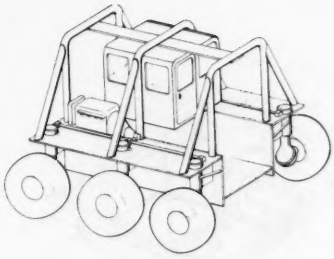
234,418
PASSENGER VEHICLE BODY
Thomas Forsey, Jr., Akron, and David D. Tompkins, Columbus, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed May 25, 1972, Ser. No. 257,062
(Filed under Rule 47(a) and 35 U.S.C. 116)
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—40



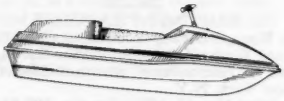


234,419
HYGROMETER
Ueli Hofstetter, Herrliberg, Switzerland, assignor to SINA AG fur Instrumentierung und Automatik, Zurich, Switzerland
Filed Jan. 2, 1973, Ser. No. 320,079
Claims priority, application Switzerland July 4, 1972
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—56

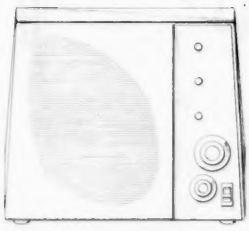
234,420
MOTORIZED TREE PROCESSING EQUIPMENT VEHICLE
Carlyle W. Schock, 3110 Mount Vernon Ave., Apt. 212, Alexandria, Va. 22301
Filed Apr. 27, 1973, Ser. No. 355,270
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—57



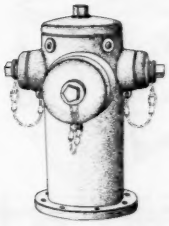
234,421
WATERCRAFT
Anselme Lapointe, Sherbrooke, Quebec, Canada, and Thomas Scott, Rawleigh, England, assignors to Bombardier Limited, Valcourt, Quebec, Canada
Filed July 16, 1973, Ser. No. 379,228
Claims priority, application Canada Feb. 16, 1973
Term of patent 3½ years
Int. Cl. D12—*06*
U.S. Cl. D12—69



234,422
TYPING PACER
John Sullivan, San Jose, Calif., and Donald J. Powers, Medford, Oreg., assignors to Owen F. Johnson, Mountain View, Calif.
Filed May 11, 1972, Ser. No. 252,538
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—91

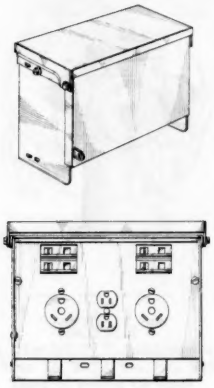


234,423
FIRE HYDRANT
James W. Dashner, Elmira, N.Y., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Apr. 12, 1973, Ser. No. 350,556
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—12

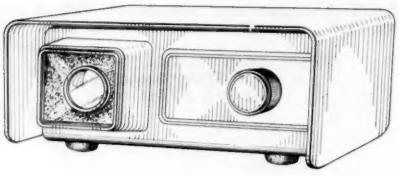


234,424
DECORATIVE SIDE PANEL FOR DENTAL CHAIR
Keith O. Rasmussen, 1550 Davidson Ave., San Francisco, Calif. 94124
Continuation-in-part of design application Ser. No. 25,479, Oct. 14, 1970. This application July 31, 1973, Ser. No. 276,386
Term of patent 14 years
Int. Cl. D24—*99*; D6—*01*
U.S. Cl. D24—1 B

234,425
POWER OUTLET BOX
Merle A. Plummer, North Hollywood, Calif., assignor to Myers Electric Products, Inc., Montebello, Calif.
Filed Aug. 4, 1972, Ser. No. 286,108
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B

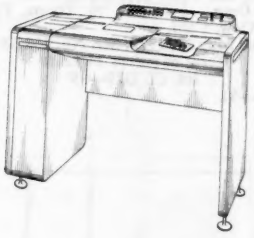


234,426
PHOTOELECTRIC EYE UNIT
James M. Gerdom, Overland Park, Kans., assignor to Honan Sales Company, Inc., Kansas City, Mo.
Filed Sept. 18, 1972, Ser. No. 289,977
Term of patent 7 years
Int. Cl. D13—*99*
U.S. Cl. D26—1 F

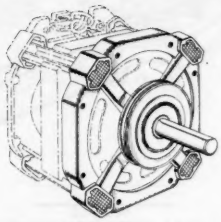


234,427
SINGLE BOWL SINK
Henry M. Stairs, Jr., Somerville, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Aug. 2, 1973, Ser. No. 385,137
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

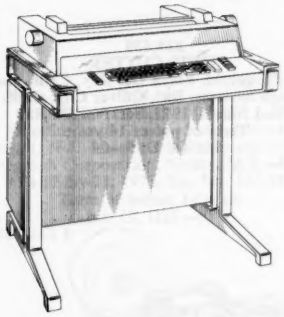
234,428
DOCUMENT ENCODER
John Eric Knox, Eisental, Affental, Andre Micault, Sinzheim, and Gerhard Hubner, Baden-Baden, Germany, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Oct. 10, 1972, Ser. No. 298,881
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



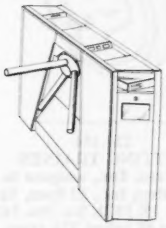
234,429
END FRAME FOR A DYNAMOELECTRIC MACHINE
Doran D. Hershberger, Sycamore, Ill., assignor to General Electric Company
Filed Apr. 21, 1972, Ser. No. 246,509
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A



234,430
ACCOUNTING MACHINE OR SIMILAR ARTICLE
John F. Armour, Dayton, Ohio, Laurence F. Plaskan, West Bend, Wis., and Pierre L. Crease, Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Mar. 30, 1973, Ser. No. 346,432
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



234,431
PASSENGER TURNSTILE
Charles R. McGehee, Culver City, and Bruce H. Osterberg, Manhattan Beach, Calif., assignors to Western Data Products, Inc., Los Angeles, Calif.
Filed Mar. 15, 1972, Ser. No. 235,107
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D28—1 B

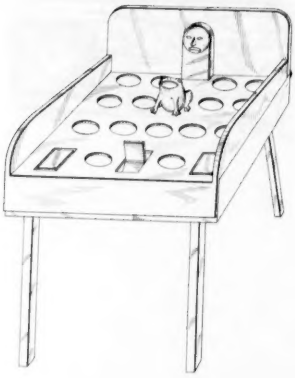


234,432
ARTIFICIAL CHRISTMAS TREE
Theodore D. Boganowski, 3059 S. 48th Ave., Omaha, Nebr. 68106, and Theodore L. Boganowski, 3003 Kansas Drive, Bellevue, Nebr. 68005
Filed Apr. 6, 1973, Ser. No. 348,726
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—1 A

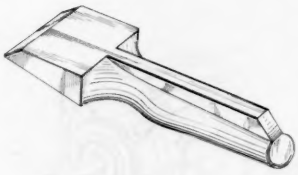
234,433
FOOTBALL WALL PLAQUE
Robert F. Zivica, St. Clair Shores, Mich., assignor to Select Markets, Inc.
Filed May 22, 1972, Ser. No. 255,380
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A

234,434
PUTTING TRAINER
Lee Trevino, El Paso, Tex., assignor to Lee Trevino Enterprises, Inc., El Paso, Tex.
Filed Mar. 15, 1973, Ser. No. 341,715
Term of patent 3½ years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

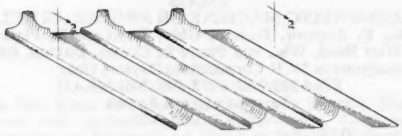
234,435
GAME TABLE
Jose Luis Pineiro, Jr. Lampa No. 1139, Of. 62, Lima, Peru
Filed Dec. 14, 1972, Ser. No. 315,189
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 J



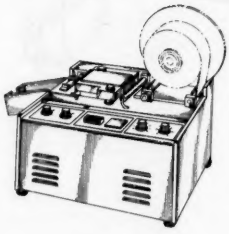
234,436
DIGGING TOOTH
Richard George Holland, P.O. Box 123, Parramatta, Grand Avenue, Camellia Industrial Estates, New South Wales 2150, Australia
Filed Jan. 8, 1973, Ser. No. 322,033
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D39—1 R



234,437
STRUCTURAL PANEL
Darrell W. Craik, Escondido, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.
Filed Sept. 21, 1972, Ser. No. 290,844
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D54—2 A



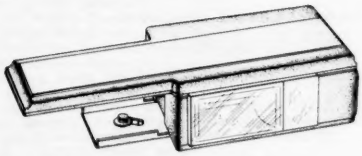
234,438
STRIP CUTTER
Timothy P. Fitzgerald, Playa Del Rey, Calif., assignor to Image Systems, Inc., Culver City, Calif.
Filed June 3, 1971, Ser. No. 149,889
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D55—1 A



234,439
COMBINED RECORD PLAYER AND AMPLIFIER
Yoshiaki Iida, Katano, and Ken Okabe, Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 20, 1973, Ser. No. 343,053
Claims priority, application Japan Sept. 20, 1972
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

234,440
COMBINED RECORD PLAYER AND AMPLIFIER
Yoshiaki Iida, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 20, 1973, Ser. No. 343,055
Claims priority, application Japan Sept. 20, 1972
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

234,441
PHOTOFLASH UNIT
John De Filippis, South Amboy, and Robert L. Taylor, Imlaystown, N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed May 21, 1973, Ser. No. 362,038
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 F



234,442
CRADLE SUPPORT FOR A CAMERA
Harry E. Mazur, P.O. Box 4508, Palm Springs, Calif. 92262
Filed July 30, 1973, Ser. No. 383,765
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 G

234,443
VEHICLE IDENTIFICATION SIGN
Abraham Golub, 4881 22nd St. NW., Lauderhill, Fla. 33313
Filed Oct. 5, 1973, Ser. No. 404,073
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF MARCH, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See—*
Tuura, Martti Johannes, 3,869,077.

A.C.I. Operations Pty. Limited: *See—*
Brungs, Michael; and Burniston, John, 3,869,270.

A.G. fur Oxydenchemie: *See—*
Beer, Henri Bernard, 3,869,359.

A/S Ferrosan: *See—*
Kring, Peder Lund; and Lund, Jorgen, 3,869,539.

A. Stucki Company: *See—*
Wagner, John H.; and Wiebe, Donald, 3,868,912.

Aa. Brovig A.S.: *See—*
Brovig, Aanen, 3,868,740.

AB Bojors: *See—*
Haggstrom, Rolf Paul; and Karlsson, Bengt-Ake, 3,869,007.

Abbo, Toma O. Apparatus for assembling and disassembling a disposable external catheter. 3,868,757, Cl. 29-200.00H.

Abbott Laboratories: *See—*
Crovetti, Aldo Joseph; Kenney, Donald Sykes; Lynch, Don Murl; and Stein, Robert George, 3,869,274.
Freiberg, Leslie Alan, 3,869,444.
Hallas, Robert; Tadanier, John Soloman; and VonEsch, Anne Mary, 3,869,445.

Abex Corporation: *See—*
Adams, Cecil E., 3,869,231.

Ackermann, Walter Thomas, to Indevco Corporation. Film handling system. 3,869,093, Cl. 242-55.210.

Ackley, Edward M., to R. W. Hartnett Company. Capsule precision printing apparatus and method. 3,868,900, Cl. 101-40.000.

Action Communication Systems, Inc.: *See—*
Epstein, Barry M., 3,869,578.

Acuna, Mario H.: *See—*
Doong, Henry; and Acuna, Mario H., 3,869,659.

Adamik, Jaroslav F. Foxing and toe cap press. 3,868,736, Cl. 12-1.00B.

Adams, Cecil E., to Abex Corporation. Vane type fluid energy translating device. 3,869,231, Cl. 418-267.000.

Adams Rite Manufacturing Company: *See—*
Eads, Charles L., 3,869,159.

Adaskin, Semen Izrailovich: *See—*
Koritsky, Andrei Vladimirovich; Ignatov, Viktor Alexandrovich; Polyak, Leonid Moiseevich; Shapiro, Semen Abramovich; Bokman, Grigory Aronovich; Mordvinov, Vladimir Alexandrovich; Zhizhin, Mikhail Ivanovich; Slonimsky, Alexandr Davydovich; Sevinian, Kimik Tigranovich; Adaskin, Semen Izrailovich; and German, Vladimir Vladimirovich, 3,869,628.

Aerazur Constructions Aeronautiques: *See—*
Hatton, Gildas, 3,868,952.

Aero-Flow Dynamics, Inc. (The Wing Company Division): *See—*
Creuz, Walter R., 3,869,243.

AGA Aktiebolag: *See—*
Smars, Erik; Mogensen, Palne; and Kaij, Mats J., 3,869,616.

Agfa-Gevaert Aktiengesellschaft: *See—*
Mader, Helmut; Otto, Rigobert; Marx, Paul; and Puschel, Walter, 3,869,291.

Agfa-Gevaert N.V.: *See—*
Philippaerts, Herman Adelbert; Pollet, Robert Joseph; Vandenberghe, Antoon Leon; and Willems, Jozef Frans, 3,869,290.

Aggarwal, Roshan L.: *See—*
Lax, Benjamin; and Aggarwal, Roshan L., 3,869,618.

Aikawa, Hiroshi: *See—*
Ito, Naganori; and Aikawa, Hiroshi, 3,869,141.

Air-Lock Plastics, Inc.: *See—*
Confer, Raymond C., 3,869,239.

Air Logistics Corporation: *See—*
Schirtzinger, Joseph F., 3,868,920.

Airco, Inc.: *See—*
Linhardt, Hans D.; Carter, Thomas A.; and Kirk, James A., 3,868,827.
Terrell, Ross C., 3,869,519.

Airfix Industries Limited: *See—*
Sutch, Brian Leo Chudleigh, 3,868,893.
Sutch, Brian Leo Chudleigh, 3,869,234.

Akron Scientific Labs: *See—*
Link, William T.; and McClatchie, Edward A., 3,869,613.

Aktiebolaget Bofors: *See—*
Olsson, Tore Bertil Reinhold, 3,869,565.

Aktiebolaget Leo: *See—*
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 3,869,527.

Albrecht, Donald. Traction device. 3,868,951, Cl. 128-75.000.

Aldous, George C., to Westinghouse Electric Corporation. Customer adjustment switch assembly. 3,869,688, Cl. 337-82.000.

Aldrich Chemical Company: *See—*
Biel, John Hans; and Klundt, Irwin L., 3,869,492.

Aldrich, Ralph E.; Feinleib, Julius; and Schmutz, Lawrence E., to Itek Corporation. Liquid crystal display containing segmented source of back-lighting. 3,869,195, Cl. 350-160.0LC.

Alfici, Ralph J.; and Cross, William B. Vessel implantable appliance and method of implanting it. 3,868,956, Cl. 128-345.000.

Alinari, Carlo. Casing for liquid-filled depth gauge. 3,868,853, Cl. 73-300.000.

Alinina, Raisa Alexeevna, administrator: *See—*
Apalikov, Jury Ignatievich; Bankovsky, Leonid Leonidovich; Gelman, Alexandr Shmulievich; Konon, Jury Alexeevich; Pervukhin, Leonid Borisovich; Tsemakhovich, Boris Davydovich; Bronovsky, Grigory Abramovich; Poretskin, Vitaly Moiseevich; Tokarev, Petr Pavlovich; and Barinov, Boris Agafonovich, deceased, 3,868,761.

Allen, John E.; Hanley, John F., Jr.; Armdur, Frank K.; Krikau, Frederick G.; and Patton, Richard S., to Interlake, Inc. Pollution-free coke quenching system. 3,869,352, Cl. 202-227.000.

Allied Chemical Corporation: *See—*
DeLong, Richard C., 3,869,485.
Jones, Harold F.; Ousterling, David L.; and Anderson, Roland W., 3,869,313.
Schweitzer, Arthur J., Jr.; and Schupak, Eugene, 3,869,329.

Allis-Chalmers Corporation: *See—*
Erickson, R. Barry, 3,869,087.
Stunkard, Norman W., 3,869,691.

Allison, William D., to Ford Motor Company. Motor vehicle suspension. 3,869,015, Cl. 180-71.000.

Allison, William D., to Ford Motor Company. Steering device having a chain operated steering gear actuator. 3,869,138, Cl. 280-93.000.

Allison, William D., to Ford Motor Company. Rear suspension for motor vehicles. 3,869,140, Cl. 280-124.00R.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Hanas, Bertil Henrik, 3,869,560.

Allstate Insurance Company: *See—*
Humphrey, Marion L.; and Tugaudis, Ernest A., 3,869,582.

Almanna Svenska Elektriska Aktiebolaget: *See—*
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Aluminum Company of America: *See—*
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Eiland, Ehrlich M., 3,869,305.
Schrecker, Howard D.; and Diekhoff, Hans H., 3,868,919.
Smith, George L., Jr.; and Diekhoff, Hans H., 3,868,918.

American Cyanamid Company: *See—*
Bennett, Robert Putnam, 3,869,453.
Cate, Alan Clifford, 3,868,749.
Johnson, Robert Bird; Rakowitz, David Henry; Barber, William Austin; and Fetchin, John Allan, 3,869,511.
Lutz, Albert William; and Walworth, Bryant Leonidas, 3,869,457.
Olsson, David Lawrence; and Singerman, Sol, 3,869,044.
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American Electronic Laboratories, Inc.: *See—*
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American Home Products Corporation: *See—*
Freed, Elisabeth H.; Freed, Meier E.; and Potoski, John R., 3,869,512.
Freed, Meier E.; and Childress, Scott J., 3,869,460.
Vezina, Claude; Saucier, Rene; and Sehgal, Surendra N., 3,869,346.

American Optical Corporation: *See—*
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Shaw, Robert R.; and Snitzer, Elias, 3,869,403.
Shaw, Robert R.; and Snitzer, Elias, 3,869,404.
Shaw, Robert R.; and Snitzer, Elias, 3,869,405.

American Plasticraft Company: *See—*
Dumas, Christ J.; and Simovits, Stephen S., Jr., 3,869,633.

American Thermostat Corporation: *See—*
Hickling, Colin D., 3,869,690.

Amering, Charles F., to Eastman Kodak Company. Novel compositions and photographic processes. 3,869,289, Cl. 96-66.300.

Amort, Jurgen: *See—*
Kotzsch, Hans-Joachim; Amort, Jurgen; Junger, Hans; Nestler, Heinz; and Weissenfels, Franz, 3,869,340.

AMP Incorporated: *See—*
Teagno, Wladimiro, 3,869,185.

Anchor Hocking Corporation: *See—*
Oglesbee, Richard K., 3,869,079.

Anderson, Andrew W.; and Mullin, John P., to Scandia Packaging Machinery Company. Apparatus for applying a label to a package. 3,869,330, Cl. 156-380.000.

Anderson, Arnold L., to Michigan Chemical Corporation. Polyacrylate plastic compositions containing bis-aryloxy flame retardants. 3,869,424, Cl. 260-45.90R.

Anderson, Arnold L., to Michigan Chemical Corporation. Poly(phenylene oxide) plastic compositions containing bis-phenoxy flame retardants. 3,869,425, Cl. 260-45.90R.

Anderson, Arnold L., to Michigan Chemical Corporation. Polyester plastic compositions containing bis-aryloxy flame retardants. 3,869,426, Cl. 260-45.90R.

Anderson, Bret W.; and Steffen, Joseph A., to Bret W. Anderson & Associates, Inc. Mailable multiple-envelope packets. 3,869,080, Cl. 229-69.000.

Anderson, Robert L., to Paul, James R., a part interest. Shovel mounted weed cutter. 3,868,775, Cl. 30-329.000.

Anderson, Roland W.: *See—*
Jones, Harold F.; Ousterling, David L.; and Anderson, Roland W., 3,869,313.

Anderson, Warren A.; Passmore, Edmund M.; and Matheson, Wilfrid G., to GTE Sylvania Incorporated. Diode-containing incandescent lamp having improved efficiency. 3,869,631, Cl. 313-217.000.

Andrews, Edwin R.; Claxton, George P.; Roberts, Edward McC.; and Fleming, Robert W., to Richardson-Merrell Inc. 2,7-Bis-basic esters and ethers of 9-benzylidenefluorence. 3,869,496, Cl. 260-465.00E.

Anglim, James Brian: *See—*
Light, Kenneth K.; and Anglim, James Brian, 3,869,524.

Anthony, Robert Leroy; and Wray, Samuel Francis, to du Pont de Nemours, E. I., and Company. Spinneret fabrication process. 3,868,870, Cl. 76-107.00S.

Anthony, William Edward. Method of making lap pin. 3,868,842, Cl. 72-367.000.

Aoki, Shingi: *See—*
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Yotumoto, Keiichi; and Sunaga, Hiromi, 3,869,362.

Aoyagi, Takaaki: *See—*
Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, 3,869,347.

Apalikov, Jury Ignatievich; Bankovsky, Leonid Leonidovich; Gelman, Alexandr Shmulievich; Konon, Jury Alexeevich; Pervukhin, Leonid Borisovich; Tsemakhovich, Boris Davydovich; Bronovsky, Grigory Abramovich; Poretskin, Vitaly Moiseevich; Tokarev, Petr Pavlovich; and Barinov, Boris Agafonovich, deceased (by Alinina, Raisa Alexeevna, administrator). Method of cladding of metal products. 3,868,761, Cl. 29-470.100.

Archibald, John Leheup, to John Wyeth & Brother Limited. N-phenyl derivatives of alkanoylamido piperidines. 3,869,463, Cl. 260-293.610.

Arens Controls, Inc.: *See—*
Neyer, James U., 3,868,865.

Arfert, Horst F. W., to Reynolds Metals Company. Sealed container and apparatus for and method of sealing same. 3,868,917, Cl. 113-1.00E.

Argus Chemical Corporation: *See—*
Minagawa, Motonobu; and Nomura, Kuniaki, 3,869,423.

Armaturen-Gesellschaft m.b.H.: *See—*
Ragailler, Franz, 3,868,905.

Armdur, Frank K.: *See—*
Allen, John E.; Hanley, John F., Jr.; Armdur, Frank K.; Krikau, Frederick G.; and Patton, Richard S., 3,869,352.

Armstrong, John Keith: *See—*
Urban, John A.; Hopkins, Gary L.; and Armstrong, John Keith, 3,869,177.

Arndt, Friedrich; and Boroschewski, Gerhard, to Schering AG. Herbicidal mixtures. 3,869,275, Cl. 71-92.000.

Arndt, Friedrich: *See—*
Boroschewski, Gerhard; and Arndt, Friedrich, 3,869,504.

Arneson, Howard M., to Arneson Products Inc. Hydromassage device. 3,868,949, Cl. 128-66.000.

Arneson Products Inc.: *See—*
Arneson, Howard M., 3,868,949.

Art Shelf Product Company: *See—*
Stoeber, Alfred; and Smialkowski, Bruno, 3,869,218.

Arthur D. Little, Inc.: *See—*
Schutte, August H.; and Stevens, James T., 3,869,543.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kominami, Naoya; Nakajima, Hitoshi; Miyata, Seiji; Kimura, Takeo; Chono, Masazumi; and Sakurai, Tokio, 3,869,500.
Ono, Hiroshi; and Yoshida, Mitsuo, 3,869,375.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Harumi, 3,869,697.

Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, to du Pont de Nemours, E. I., and Company. Apparatus for gradient elution. 3,869,067, Cl. 222-70.000.

Associated Engineering Limited: *See—*
Hunt, Norman; and Noddings, John, 3,868,869.

Astheimer, Karl, to General Motors Corporation. Rear axle suspensions for motor vehicles. 3,869,016, Cl. 180-73.00R.

Atlantic Richfield Canada Ltd.: *See—*
Schutte, Robert, 3,869,384.

Atlantic Richfield Company: *See—*
James, Dean B., 3,869,536.

Atlas Pacific Engineering Company: *See—*
Loveland, Malcolm W., 3,869,041.

Auspurg, Heinz; Huber, Josef; Rabold, Jurgen; and Wohlert, Gunther, to Siemens Aktiengesellschaft. Storage unit test control device. 3,869,603, Cl. 235-153.0AM.

Automatic Braiding Company (Nottingham) Limited: *See—*
Lynam, John Edward, 3,868,729.

Automobiles Peugeot: *See—*
Dera, Alain; and Besseau, Daniel, 3,869,163.
Rivere, Jean-Pierre, 3,868,936.

Autotrol Corporation: *See—*
Torpey, Wilbur N., 3,869,380.

AVM Corporation: *See—*
Sheppard, William L., 3,868,991.

Avtron Manufacturing, Inc.: *See—*
Safer, Michael B.; and Menegos, Andrew J., 3,869,664.

Awano, Tsuneo: *See—*
Masuzawa, Isao; Onishi, Kazutoshi; and Awano, Tsuneo, 3,869,653.

Ayers, Buell O.; and Roof, Lewis B., to Phillips Petroleum Company. Multipositional selector valve. 3,868,970, Cl. 137-625.460.

Ayres, Barry Edward: *See—*
Phillipps, Gordon Hanley; Newall, Christopher Earle; and Ayres, Barry Edward, 3,869,451.

Back, Gerhard; and Fasciati, Alfred, to Ciba-Geigy AG. Metal-complex azo dyestuffs containing a 5-substituted-2,3-dihydroxypyridine as coupling component. 3,869,440, Cl. 260-146.00R.

Backhouse, Geoffrey Howard; and Leggett, Norman Derek, to International Standard Electric Corporation. Stud mount for light emissive semiconductor devices. 3,869,702, Cl. 357-74.000.

Bailey, Denis M., to Sterling Drug Inc. (2,3-Dihydro-2-benzofuranylmethyl)aminoguanidines. 3,869,478, Cl. 260-346.20R.

Bailey, James R.: *See—*
Klein, Carl F.; Korta, Lawrence B.; and Bailey, James R., 3,869,681.

Bailly, Roger: *See—*
Peltier, Henri; Chatourel, Pierre; and Bailly, Roger, 3,869,055.

Baker Oil Tools, Inc.: *See—*
Crowe, Talmadge L., 3,868,995.

Baldwin, James French. High temperature alloys. 3,869,284, Cl. 75-134.00F.

Ball, Eric, to Dunlop Holdings Limited. Reinforced flexible articles. 3,868,974, Cl. 138-129.000.

Ball, Richard L.: *See—*
Lambert, Everette M.; and Ball, Richard L., 3,869,327.

Ballentine, John D., to PPG Industries, Inc. Heat and light reflecting spandrel. 3,869,198, Cl. 350-259.000.

Bankovsky, Leonid Leonidovich: *See—*
Apalikov, Jury Ignatievich; Bankovsky, Leonid Leonidovich; Gelman, Alexandr Shmulievich; Konon, Jury Alexeevich; Pervukhin, Leonid Borisovich; Tsemakhovich, Boris Davydovich; Bronovsky, Grigory Abramovich; Poretskin, Vitaly Moiseevich; Tokarev, Petr Pavlovich; and Barinov, Boris Agafonovich, deceased, 3,868,761.

Bara, Edwin S., to Motorola, Inc. Magnetic tape head indexing assembly for a cartridge tape player. 3,869,724, Cl. 360-106.000.

Barber, Richard H., to McGill Manufacturing Company, Inc. Resilient multiple element bearing seal. 3,869,181, Cl. 308-187.200.

Barber, William Austin: *See—*
Johnson, Robert Bird; Rakowitz, David Henry; Barber, William Austin; and Fetchin, John Allan, 3,869,511.

Barinov, Boris Agafonovich, deceased: *See—*
Apalikov, Jury Ignatievich; Bankovsky, Leonid Leonidovich; Gelman, Alexandr Shmulievich; Konon, Jury Alexeevich; Pervukhin, Leonid Borisovich; Tsemakhovich, Boris Davydovich; Bronovsky, Grigory Abramovich; Poretskin, Vitaly Moiseevich; Tokarev, Petr Pavlovich; and Barinov, Boris Agafonovich, deceased, 3,868,761.

Barkley, Ronald A. Apparatus for temporary storage of articles. 3,869,115, Cl. 271-147.000.

Bartel Engineering Limited: *See—*
Fry, Timothy Selwyn, 3,869,147.

Barth, Hans Dieter; and Brand, Erich, to Chemiebau, Dr. A. Zieren GmbH & Co., K.G. Removal of impurities during the recovery of crude phthalic anhydride. 3,869,479, Cl. 260-346.400.

Basi, Jagtar Singh. to International Business Machines Corporation. Method of polishing zinc selenide. 3,869,323, Cl. 156-17.000.

Basi, Jagtar Singh; and Mendel, Eric, to International Business Machines Corporation. Method of polishing cadmium telluride. 3,869,324, Cl. 156-17.000.

Battcock, Whalley Vowe, to Coal Industry (Patents) Limited. Method and apparatus for the generation and transfer of heat. 3,868,993, Cl. 165-104.000.

Battersby, William R., to USM Corporation. Double glazing unit. 3,868,805, Cl. 52-616.000.

Battershell, Robert D., to Diamond Shamrock Corporation. Production of tetrachlorophthalonitriles. 3,869,494, Cl. 260-465.00G.

Bauer, Benjamin B.; Gravereaux, Daniel W.; and Torick, Emil L., to Columbia Broadcasting System, Inc. Quadruphonic disc recording system utilizing single sideband modulation. 3,869,583, Cl. 179-100.4ST.

Bayer Aktiengesellschaft: *See—*
Hoppe, Peter; Leyer, Helmut; and Muller, Johann, 3,869,337.
Kuhle, Engelbert; and Klauke, Erich, 3,869,509.
Neuner, Otto; and Dorlars, Alfons, 3,869,469.

Bazille, James H., Jr., to Minnesota Mining and Manufacturing Company. Solderless wire connector. 3,869,190, Cl. 339-98.000.

BBC Brown Boveri & Company Limited: *See—*
Benz, Hans, 3,869,686.
Eidinger, Adolf; and Floessel, Carl-Dieter, 3,869,562.
Meyer, Gundolf, 3,868,768.
Muellerpoths, Reiner, 3,868,963.

Beardmore, Geoffrey; and Evans, Hugh N., to Smiths Industries Limited. Methods of sputter deposition of materials. 3,869,368, Cl. 204-192.000.

Beasley, Donald L.: *See—*
Townsend, Ray T.; and Beasley, Donald L., 3,868,747.

Beatrice Foods Co.: *See—*
Leahy, Richard M., 3,869,052.

Bebris, Natalya Karlovna; Kiselev, Andrei Vladimirovich; Nikitin, Jury Stepanovich; and Yashin, Yakov Ivanovich. Process for preparing a wide-pore adsorbent for use in chromatography. 3,869,409, Cl. 252-446.000.

Becker, Carl E.: *See—*
Becker, Peter W.; Price, Albert E.; Mowatt-Larssen, Erling; and Becker, Carl E., 3,868,913.

Becker, Otto Alfred. Electroplating of the cut edges of sheet metal panels. 3,869,372, Cl. 204-224.00R.

Becker, Peter W.; Price, Albert E.; Mowatt-Larssen, Erling; and Becker, Carl E., to General American Transportation Corporation. Hopper vehicle. 3,868,913, Cl. 105-240.000.

Bedline Mfg. Co.: *See—*
Spitz, Melvin P.; and Sproule, John W., 3,868,733.

Beecham Group Limited: *See—*
Palmer, Derek Reginald, 3,869,505.

Beer, Henri Bernard, to A.G. fur Oxydenchemie. Method of making intimately admixed metal oxides. 3,869,359, Cl. 204-96.000.

Bell, Franklin D. Perspective line generator. 3,868,777, Cl. 33-77.000.

Bell & Howell Company: *See—*
Schmidt, Josef, 3,869,718.

Bell, Jonathan Durand: *See—*
Karasa, Alvydas Petras; and Bell, Jonathan Durand, 3,869,089.

Bell Telephone Laboratories, Incorporated: *See—*
Kolensky, Leo Michael; Pilc, Randolph John; Schlanger, Gabriel Gary; and Willand, Allan Howard, 3,869,573.
Scerbo, Louis Joseph, 3,868,859.

Bellmann, Walter: *See—*
Springer, Willi; and Bellmann, Walter, 3,868,753.

Bellomy, Robert C., to Chevron Research Company. Aluminum coatings based on clay-emulsified asphalts. 3,869,297, Cl. 106-277.000.

Belohoubek, Erwin Franz; and Presser, Adolph, to RCA Corporation. Microwave transistor carrier for common base class a operation. 3,869,677, Cl. 330-31.000.

Beloit Corporation: *See—*
Diltz, Jack L., 3,869,095.

Bendix Corporation, The: *See—*
Chlebowski, Richard A., 3,869,027.
Moseman, Paul W., Jr., 3,868,843.
Roberts, James K.; and Pauwels, Edward M., 3,868,890.

Bennett, Robert Putnam, to American Cyanamid Company. Iron carbonyl complex of aromatic azo compounds complexed with particular phosphine arsine or stibine compounds. 3,869,453, Cl. 260-242.000.

Benoit, Roland A.; and Guillot, Edmond P., to Interroyal Corporation. Hospital exercise bar. 3,868,734, Cl. 5-317.00B.

Benson Mfg. Corporation: *See—*
Bice, Donald A., 3,868,803.

Benson, Robert F., to Texaco Inc. Aromatic hydrogenation using sodium borohydride reduced transition metal supported catalysts. 3,869,521, Cl. 260-667.000.

Bentz, Erwin J. H.: *See—*
Getz, Marvin G.; and Bentz, Erwin J. H., 3,868,992.

Bentz, Gerard: *See—*
Galey, Jean G.; and Bentz, Gerard, 3,868,987.

Benz, Hans, to BBC Brown Boveri & Company Limited. Superconductive coils incorporating insulation between adjacent winding layers having a contraction rate matching that of the superconductive material. 3,869,686, Cl. 335-216.000.

Berger, Julius; Pruess, David; and Scannell, James Parnell, to Hoffmann-La Roche Inc. Herbicidal composition and methods. 3,869,277, Cl. 71-113.000.

Berkley & Company, Inc.: *See—*
Foote, Danny R., 3,868,785.

Berlin & Jones Company, Inc.: *See—*
Watson, Charles S., 3,868,894.

Berliner Maschinenban-Actien-Gesellschaft: *See—*
Tschierse, Klaus, 3,869,663.

Bernard, William R.; and Buslik, Walter S., to International Business Machines Corporation. Magnetic pattern recording. 3,869,711, Cl. 360-17.000.

Berry Metal Company: *See—*
Chang, Yi-Chung; Rymarchyk, Nicholas M.; and Greenstine, Robert B., 3,869,369.

Bertrand, Claude: *See—*
Gradeff, Peter S.; and Bertrand, Claude, 3,869,517.

Besseau, Daniel: *See—*
Dera, Alain; and Besseau, Daniel, 3,869,163.

Bessette, Georges Henri. Expansible pulley with speed and torque responsive means. 3,868,862, Cl. 74-230.17E.

Bethmann, Karl-Wilhelm: *See—*
Vorster, Hans-Jurgen; Kunath, Paul; and Bethmann, Karl-Wilhelm, 3,869,379.

Beutner, Heinz Paul; and Feick, George, to International Nickel Company, Inc., The. Production of nickel sulfate. 3,869,257, Cl. 423-544.000.

Bice, Donald A., to Benson Mfg. Corporation. Plastic shutter and mounting clamp therefor. 3,868,803, Cl. 52-473.000.

Biel, John Hans; and Klundt, Irwin L., to Aldrich Chemical Company. Di-substituted beta-phenethylcarbamic acid esters. 3,869,492, Cl. 260-463.000.

Bierman, Howard R.; and Mast, John G. Flow controlling or metering device. 3,868,973, Cl. 138-43.000.

Biffle, Morris S. Rotary drilling head assembly. 3,868,832, Cl. 64-23.500.

Bigalke, Erhard: Buttgereit, Werner; and Pundt, Dieter, to Volkswagenwerk Aktiengesellschaft. Combustion motor. 3,868,933, Cl. 123-102.000.

Bingham, Chalice, to Sealectro Corporation. Quick connect/disconnect coax connector. 3,869,187, Cl. 339-91.00P.

Biorex Laboratories, Limited: *See—*
Turner, John Cameron; and Chan, Rosalind Po Kuen, 3,869,458.

Birrell, Raymond Nicolson: *See—*
Combey, Malcolm; and Birrell, Raymond Nicolson, 3,869,526.

Bischoff, Leo E.; and Keller, Chris F., Jr., to General Motors Corporation. Windshield wiper control circuit. 3,869,654, Cl. 318-443.000.

Bizerba-Werke Wilhelm Kraut K.G.: *See—*
Kuhnle, Ernst; and Schwarz, Josef, 3,869,008.
Kuhnle, Ernst, 3,869,009.

Black and Decker Manufacturing Company, The: *See—*
Karasa, Alvydas Petras; and Bell, Jonathan Durand, 3,869,089.

Blades, Herbert, to du Pont de Nemours, E. I., and Company. High strength polyamide fibers and films. 3,869,429, Cl. 260-78.00S.

Blades, Herbert, to du Pont de Nemours, E. I., and Company. High modulus, high tenacity poly(p-phenylene terephthalamide) fiber. 3,869,430, Cl. 260-78.00S.

Blanchard, Lucien: *See—*
Reichardt, Wolfgang; Blanchard, Lucien; and Denamps, Jean, 3,868,858.

Blankenship, Larry Thomas, to Dow Chemical Company, The. Flexible polyurethane foams. 3,869,413, Cl. 260-2.5BE.

Blankumsee, Howard: *See—*
Collins, Walter; and Blankumsee, Howard, 3,869,595.

Blazey, Richard N.: *See—*
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Bledsoe, Woodrow W. Fiber baling apparatus. 3,868,809, Cl. 53-117.000.

Blethen, William M., to Retention Communication Systems, Inc. Apparatus for qualifying recorded tone bursts. 3,869,716, Cl. 360-55.000.

Blum, Hans, to Hans und Heinrich Blum OHG. Method and apparatus for comminuting tree stumps. 3,868,980, Cl. 144-2.00N.

Board of Regents of the University of Nebraska: *See—*
Mebus, Charles A.; and Twiehaus, Marvin J., 3,869,547.

Board of Regents, State of Florida: *See—*
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Bobier, Wilfred S., to Oilgear Company, The. Fluid device having means for aligning a cylinder barrel. 3,868,889, Cl. 91-506.000.

Boeing, William E.: *See—*
Seymour, David Jackson; MacRitchie, Norman; Matthews, Parker J.; and Clark, Thomas A., 3,868,921.

Bogert, Clayton. Safety closure for containers. 3,869,058, Cl. 215-219.000.

Bogulslawski, Jan Janusz; Geyer, Paul; and Taff, Frederick Nishwitz, to Uniroyal, Inc. Fabric coating by extrusion die-calendering apparatus and method. 3,869,304, Cl. 117-65.200.

Boiko, Georgy Alexandrovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leonid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Perepelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich, 3,869,592.

Bokman, Grigory Aronovich: *See—*
Koritsky, Andrei Vladimirovich; Ignatov, Viktor Alexandrovich; Polyak, Leonid Moiseevich; Shapiro, Semen Abramovich; Bokman, Grigory Aronovich; Mordvinov, Vladimir Alexandrovich; Zhizhin, Mikhail Ivanovich; Slonimsky, Alexandr Davydovich; Sevinian, Kimik Tigranovich; Adaskin, Semen Izrailovich; and German, Vladimir Vladimirovich, 3,869,628.

Bokovoy, Ronald D.: *See—*
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Bondie, Dale J., to Ex-Cell-O Corporation. Tool holding assembly. 3,868,886, Cl. 90-11.00D.

Booker, Aylwin Reed, to Everlube Corporation of America. Solid lubricant adhesive film. 3,869,393, Cl. 252-12.200.

Borbely, Erno, to Dynaco Inc. A.f.c. disabling circuitry. 3,869,674, Cl. 325-422.000.

Borer, Charles: *See—*
Mosimann, Hans; Heim, Peter; and Borer, Charles, 3,869,428.

Boroschewski, Gerhard; and Arndt, Friedrich. Herbicidal methylphenyl carbamates. 3,869,504, Cl. 260-471.00C.

Boroschewski, Gerhard: *See—*
Arndt, Friedrich; and Boroschewski, Gerhard, 3,869,275.

Borsig GmbH: *See—*
Losel, Georg; and Eickenberg, Leonhard, 3,868,927.

Bos, Fredericus Antonius Jozef, to Polva-Nederland B.V. Machine for binding together a number of bars, tubes or similar elongated objects. 3,868,810, Cl. 53-198.00R.

Bosch, Paul, to Robert Bosch G.m.b.H. Pumping system. 3,869,223, Cl. 417-212.000.

Bowles, Andrew D.; and Parsons, Samuel J. Uniform lightweight concrete and plaster. 3,869,295, Cl. 106-90.000.

Bowman, Jon G.: *See—*
Seymour, David Jackson; MacRitchie, Norman; Matthews, Parker J.; and Clark, Thomas A., 3,868,921.

Boyce, Jack R. Apparatus for working frozen ground. 3,868,825, Cl. 61-36.00A.

Boyle, Daniel J.: *See—*
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Bozzato, Giuliano; and Pesaro, Mario, to Givaudon Corporation. Novel odorants. 3,869,493, Cl. 260-464.000.

Bradford, Jack R.: *See—*
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Bradshaw, Arthur; and Meadows, Frank William, to Service (Engineers) Limited. Multi-station printing machine for ceramic ware. 3,868,902, Cl. 101-44.000.

Brand, Erich: *See—*
Barth, Hans Dieter; and Brand, Erich, 3,869,479.

Braun, Eric A., to Ex-Cell-O Corporation. Liquid proof flat end container with reclosable pour spout. 3,869,078, Cl. 229-17.00R.

Brazer, Geoffrey R.: *See—*
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Brennan, William M.: *See—*
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Brenner, I. Edward. Manually adjustable tooth brush. 3,868,742, Cl. 15-172.000.

Brent, Albert: *See—*
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Bresser, Robert E.: *See—*
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Bret W. Anderson & Associates, Inc.: *See—*
Anderson, Bret W.; and Steffen, Joseph A., 3,869,080.

Brett, Horace William Walter; and Fox, Richard, to ICI Australia Limited. Explosive composition containing biopolymeric material, method of preparing and using. 3,869,320, Cl. 149-41.000.

Brewster, Linda C.: *See—*
Hasegawa, Shin; and Brewster, Linda C., 3,869,345.

Breyer, Eberhard, to Siemens Aktiengesellschaft. Apparatus for determining the tensile stress in a continuously moving web of material. 3,868,851, Cl. 73-144.000.

Briar, Thomas J.; and Schaefer, William L., to PPG Industries, Inc. Method and apparatus for chopping fibers. 3,869,268, Cl. 65-2.000.

Bride, John Edwin, to du Pont de Nemours, E. I., and Company. Werner chromium complexes and methods for their preparation. 3,869,488, Cl. 260-438.50C.

Brinkman, Glen E. Rotary gear device to provide pulsating flow. 3,869,224, Cl. 417-383.000.

Briotet, Jean Paul Francois Gilbert: *See—*
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British Insulated Callender's Cables Limited: *See—*
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British Titan Limited: *See—*
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Brock, James Donald; Mize, Erbie G.; and Rylander, Henry G., to CMI Corporation. Aggregate analysis and delivery system. 3,869,110, Cl. 259-149.000.

Bronovsky, Grigory Abramovich: *See—*
Apalikov, Jury Ignatievich; Bankovsky, Leonid Leonidovich; Gelman, Alexandr Shmulievich; Konon, Jury Alexeevich; Pervukhin, Leonid Borisovich; Tsemakhovich, Boris Davydovich; Bronovsky, Grigory Abramovich; Poretskin, Vitaly Moiseevich; Tokarev, Petr Pavlovich; and Barinov, Boris Agafonovich, deceased, 3,868,761.

Brovig, Aanen, to Aa. Brovig A.S. Vertical, freely-suspended rotary brushes for automobile/vehicle washing machines. 3,868,740, Cl. 15-21.00D.

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Brown, Raymond C.; and Bokovoy, Ronald D., to Superior Industries, Inc. Wheel structure for different bolt circle diameters. 3,869,174, Cl. 301-9.0DN.

Brown, William Henry. Mud diverting kelly saver sub. 3,869,150, Cl. 285-13.000.

Brumbaugh, Robert J., to Teleflex Incorporated. Inorganic coating compositions and a method. 3,869,293, Cl. 106-14.000.

Brungs, Michael; and Burniston, John, to A.C.I. Operations Pty. Limited. Glass colour changes. 3,869,270, Cl. 65-134.000.

Bruning, Elmer Eugene: *See—*
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Brunschwig, John M.; and Stone, William M., to General Electric Company. Method and apparatus for assembling components for a dynamoelectric machine. 3,868,767, Cl. 29-598.000.

Brunswick Corporation: *See—*
Noe, Gerald H.; and Woodfill, William L., 3,868,833.
Roberts, John A.; and Roberts, Peter R., 3,868,792.

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Buckman, Stanley J.; Fenyes, Joseph G. E.; Flangan, Kenneth J.; Pera, John D.; and Pulido, Miguel L., 3,869,513.

Buckman, Stanley J.; Fenyes, Joseph G. E.; Flangan, Kenneth J.; Pera, John D.; and Pulido, Miguel L., to Buckman Laboratories, Inc. Dinitro-dialklyamino-acetophenones. 3,869,513, Cl. 260-577.000.

Bugaut, Andree: *See—*
Lang, Gerard; and Bugaut, Andree, 3,869,454.

Bulmer, Donald L. Occupant actuated means for propelling, stopping, directing, and curb hopping a wheelchair. 3,869,146, Cl. 280-242.0WC.

Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyst carrier for exhaust gas purifier. 3,869,410, Cl. 252-455.00R.

Burcher, Ernest E.; Jobson, Daniel J.; Katzberg, Stephen J.; and Kelly, William L., IV, to United States of America, National Aeronautics and Space Administration. Spectrometer integrated with a facsimile camera. 3,869,212, Cl. 356-189.000.

Burchette, Joseph F. Test scoring device. 3,868,782, Cl. 35-48.00R.

Burger, Norman P.: *See—*
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Burke, Roger E., to Union Camp Corporation. Coating composition and novel complexer therefor. 3,869,484, Cl. 260-404.500.

Burniston, John: *See—*
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Burns, Russell W., to Merit Abrasive Products, Inc. Rotary buffing sleeve. 3,868,791, Cl. 51-34.00J.

Burroughs Corporation: *See—*
Eldert, Cornelius; and Quiogue, Virgilio J., 3,869,669.

Burst, Hermann; and Wiener, Rolf, to Dr. -Ing. h.c.F. Porsche K.G. Front end for increasing dynamic wheel pressure of passenger motor vehicles. 3,869,166, Cl. 293-69.00R.

Bush, George F., to Ford Motor Company. Side door intrusion protection. 3,868,796, Cl. 52-618.000.

Buslik, Walter S.: *See—*
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Buttel, Helmut; Isert, Ingo Rudiger; Leicht, Alfred; and Schach, Albert, to International Standard Electric Corporation. Sealed contact capable of being magnetically actuated. 3,869,685, Cl. 335-196.000.

Buttgereit, Werner: *See—*
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Byrne, Sydnor H., Jr.: *See—*
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Byrom, Raymond R. Portable storage cart. 3,869,137, Cl. 280-47.190.

C.A.V. Limited: *See—*
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Cahoy, Roger P.; and Sanjean, John, to Gulf Research & Development Company. 3,5-Ditert.butyl-4-(N-benzoylcarbamyloxy)-benzylidenemalononitrile. 3,869,497, Cl. 260-465.00D.

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Cameo, Inc.: *See—*
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Cameron, Anson W. Control and handling of garment hangers. 3,868,906, Cl. 104-89.000.

Camille Bauer Messinstrumente AG: *See—*
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Camillo, Charles Carl, to Illinois Tool Works, Inc. Contactless electrical thermostat employing a bimetallic strip. 3,869,619, Cl. 307-117.000.

Camillus Cutlery Company: *See—*
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Campbell, Craig C., to Mobil Oil Corporation. Wax emulsions containing proteinaceous emulsifiers. 3,869,414, Cl. 260-6.000.

Campbell, Robert W., to Phillips Petroleum Company. Arylene sulfide polymers. 3,869,433, Cl. 260-79.100.

Campbell, Robert W.; and Scoggins, Lacey E., to Phillips Petroleum Company. Soluble arylene sulfide polymers. 3,869,434, Cl. 260-79.100.

Camras, Marvin, to IIT Research Institute. Video playback system with flutter tolerant clamping. 3,869,712, Cl. 360-33.000.

Canada-Cities Service Ltd.: *See—*
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Canicatti, Carl L., to United States of America, National Aeronautics and Space Administration. Voltage monitoring system. 3,869,667, Cl. 324-113.000.

Canon Kabushiki Kaisha: *See—*
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Watanabe, Asao; Kasahara, Tadayoshi; and Sugahara, Noboru, 3,869,211.

Caporicci, Domenico, to Norstar Ski Corporation Ltd. Ski boot. 3,868,783, Cl. 36-2.5AL.

Cardani, Charles S., to General Motors Corporation. Digital speed control system utilizing a countdown register. 3,869,019, Cl. 180-105.00E.

Cardwell, Paul H.: *See—*
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Carlton, Lewis M.: *See—*
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Carroll, Charles A., to International Husky, Inc. Aircraft. 3,869,102, Cl. 244-36.000.

Carter, David L., to Texas Instruments Incorporated. Charge coupled imager. 3,869,572, Cl. 178-7.100.

Carter, Hugh P., Jr.: *See—*
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Carter, Thomas A.: *See—*
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Castaigne, Albert Rene, to Centre d'Etudes pour l'Industrie Pharmaceutique. Stimulating device having a controlled power. 3,869,661. Cl. 323-20.000.
Cate, Alan Clifford, to American Cyanamid Co. Method of texturizing thermoplastic yarn. 3,868,749, Cl. 28-72.150.
Caterpillar Tractor Company: *See—*
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Centre d'Etudes pour l'Industrie Pharmaceutique: *See—*
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Chally, Russell. Garment box. 3,869,076, Cl. 229-32.000.
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Chang, Yi-Chung; Rymarchyk, Nicholas M.; and Greenstine, Robert B., to Berry Metal Company. Vibrating oxygen probe. 3,869,369, Cl. 204-195.00S.
Chapman, Emmett H. Musical instrument construction. 3,868,880, Cl. 84-267.000.
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Chemiebau, Dr. A. Zieren GmbH & Co., K.G.: *See—*
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Chen, Bu Shing, to Hyperion Incorporated. Diluter probe assembly. 3,869,068, Cl. 222-148.000.
Cherry, Wesley R.; and Scott, Kenneth A., to Sun Ventures, Inc. Purification of alkyl naphthalenes by distillation and furfural extraction. 3,869,357, Cl. 203-43.000.
Chevron Research Company: *See—*
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Chiari, Natale, to Edera S.p.A. Officina Meccanica Tessile. Spinning frame having two confrontingly mounted ring rows. 3,868,814, Cl. 57-34.500.
Childress, Scott J.: *See—*
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Chono, Masazumi: *See—*
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Ciciulla, Joseph. Safety latch mechanism for vehicle doors. 3,869,158, Cl. 292-35.000.
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Clark, Thomas P. Process for separation and cleaning of edible vegetable products. 3,869,559, Cl. 426-481.000.
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Coll-Palagos, Miguel, to Stauffer Chemical Company. Embossing rollers and method of embossing. 3,869,535, Cl. 264-219.000.
Collins, Jerome Howard, to Procter & Gamble Company, The. Liquid detergent compositions. 3,869,399, Cl. 252-118.000.
Collins, Keith Douglas, to Lucas Aerospace Limited. Spark ignition systems. 3,869,645, Cl. 315-209.00T.
Collins, Walter; and Blankumsee, Howard. Insulated heated lunch box. 3,869,595, Cl. 219-387.000.
Collins, William O. Visual approach and landing system for aircraft. 3,868,778, Cl. 33-227.000.
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Cook, Kenneth Allen; and Porter, Townsend Henry, Jr., to International Business Machines Corporation. Stored value system. 3,869,700, Cl. 340-149.00A.

Cooper, Richard D., to Johnson & Johnson. Disposable shoe covering. 3,869,647, Cl. 317-2.00B.

Corcoran, John J.; and Kalinowski, Paul W., to Norton Company. Internally safety reinforced cup grinding wheel. 3,868,793, Cl. 51-209.00R.

Corcoran, John J.: *See*—
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Corser, Paul J.: *See*—
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Corsover, Stephen Leonard: *See*—
Woywood, Dennis Joseph; and Corsover, Stephen Leonard, 3,869,705.

Couchman, Richard, to Aluminum Company of America. Process and means for making thick end tube and pipe. 3,868,841, Cl. 72-260.000.

Coult, John H. Friction driven rotary cleaning apparatus. 3,868,741, Cl. 15-79.000.

Coulter Electronics, Inc.: *See*—
Longman, Millard Dumas, Jr., 3,869,084.

Couturier, Robert A.; Davis, Steven J.; and Robbins, G. Howard, to General Datacomm Industries, Inc. Method and apparatus for control signaling in fdm system. 3,869,577, Cl. 179-2.0DP.

Coval, Donald E.: *See*—
Dalgard, Dan W.; and Coval, Donald E., 3,869,550.

Cove, Anthony Raymond; and Tween, Jack. Machines for washing bottles and like containers and removing labels therefrom. 3,868,960, Cl. 134-73.000.

Covington, Edward L. Blemish compensator. 3,869,567, Cl. 178-7.200.

Creuz, Walter R., to Aero-Flow Dynamics, Inc. (The Wing Company Division). Air/fuel ratio control means for dual fuel burners. 3,869,243, Cl. 431-90.000.

Crisp, John Josiah: *See*—
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Crompton & Knowles Corporation: *See*—
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Cros, Jean-Louis: *See*—
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Cross, William B.: *See*—
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Crovetti, Aldo Joseph; Kenney, Donald Sykes; Lynch, Don Murl; and Stein, Robert George, to Abbott Laboratories. Method and composition for inducing fruit abscission. 3,869,274, Cl. 71-92.000.

Crowe, Talmadge L., to Baker Oil Tools, Inc. Sub-surface safety valve. 3,868,995, Cl. 166-224.00A.

Cseke, Stephen. Manually operated washing device. 3,869,216, Cl. 401-43.000.

Cudworth, Allen L.: *See*—
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Cummings, Richard D., to Itek Corporation. Solar energy absorber. 3,869,199, Cl. 350-293.000.

Cunningham, Francis V.; and Wicks, John S., to Joslyn Mfg. and Supply Co. Disconnector. 3,869,650, Cl. 317-61.000.

Cuomo, Jerome J.; and Hovel, Harold J., to International Business Machines Corporation. Automatic P-N junction formation during growth of a heterojunction. 3,869,322, Cl. 148-188.000.

Cupp, Frederick B., to Edmac Associates Inc. Event logging system using a magnetic recorder. 3,869,707, Cl. 360-5.000.

Curran, Patrick M.; Brazer, Geoffrey R.; and Erickson, John S. Method of cleaning nickel alloy by filtering. 3,869,282, Cl. 75-82.000.

Cutler-Hammer, Inc.: *See*—
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Patz, Roman J.; Sell, Frank O.; and Halbeck, Werner B., 3,869,586.

Cutter Laboratories, Inc.: *See*—
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Cwycyshyn, Walter; and Buccellato, Anthony, to General Motors Corporation. Latching mechanism for securing a vehicle to a transporter. 3,869,144, Cl. 280-179.00R.

Dabis, Georges, to Societe d'Etudes et d'Exploitation de Marques et Brevets-S.E.M.S. Medicament for the treatment of disorders of the eye. 3,869,548, Cl. 424-94.000.

Daimler-Benz Aktiengesellschaft: *See*—
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Schacher, Hans-Dieter; Fischer, Reinhold; and Kunst, Matthias, 3,869,373.
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Dalgard, Dan W.; and Coval, Donald E., to Environmental Science Corporation. Method for the control of fertility. 3,869,550, Cl. 424-227.000.

Daniels, David A.; and DeGeorge, Nicholas F., to W. R. Grace & Co. Lubricant composition and method. 3,869,394, Cl. 252-46.700.

Daniels, Raymond Robert James, to Guy Raymond Engineering Company Limited. Furniture legs. 3,869,105, Cl. 248-188.800.

Danylewich, David S., to Lawrence Peska Associates, Inc. Eyeglass frames. 3,869,200, Cl. 351-85.000.

Dattilo, Donald J., to Motorola, Inc. Combination end of tape sensor and tape guide device. 3,869,725, Cl. 360-130.000.

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David, Jacques; and Gay, Guy, to Commissariat a l'Energie Atomigue. Device for rapid closure and pressurization of a compression chamber. 3,869,241, Cl. 425-405.00H.

Davies, Emrys; and Rippon, John Roy, to British Steel Corporation. Alloying steels. 3,869,283, Cl. 75-129.000.

Davis, Herbert T.; and Reid, James B., to Motorola, Inc. Welded interconnection printed circuit board and method of making same. 3,868,770, Cl. 29-626.000.

Davis, James L.; and Pechous, Leslie Joseph, to General Motors Corporation. Voltage booster. 3,869,660, Cl. 323-17.000.

Davis, Noel, to Integrated Development & Manufacturing Company. Environmental growth control apparatus. 3,869,605, Cl. 240-47.000.

Davis, Stanley R., to Signetics Corporation. Method for fabricating precision layer silicon-over-oxide semiconductor structure. 3,869,321, Cl. 148-175.000.

Davis, Steven J.: *See*—
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Davison, John; and Edwards, Hugh Jeremy Willis, to CCL Systems Limited. Multi-strand stressing jack. 3,868,850, Cl. 73-143.000.

Dawes, James Wilkinson; Seligman, Kurt Lothar; and Smith, Stanley George, to du Pont de Nemours, E. I., and Company. Blend of polymers. 3,869,422, Cl. 260-42.470.

Day, Leon E.; and Millican, Amond B. Device for preventing pressure or vacuum build-up in pneumatic brake systems. 3,869,178, Cl. 303-67.000.

Days-Ease Home Products Corporation: *See*—
Levey, John S.; Miller, Sandra R.; and Levey, Robert F., 3,869,069.

Decker, Gernot; Herold, Hans; and Rohr, Horst, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Holographic recording material for infrared radiation. 3,869,301, Cl. 117-36.100.

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Delavie, Jean-Henri, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for the use of a facsimile apparatus as a printing mechanism. 3,869,571, Cl. 178-30.000.

DeLong, Richard C., to Allied Chemical Corporation. Preparation of acid chlorides with phosgene in the presence of a catalyst. 3,869,485, Cl. 260-408.000.

Delves-Broughton, James, to International Standard Electric Corporation. Electrotinning wire. 3,869,371, Cl. 204-206.000.

Denamps, Jean: *See*—
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Dera, Alain; and Besseau, Daniel, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Hydraulic shock-absorbing bumpers. 3,869,163, Cl. 293-63.000.

Der Marderosian, Aaron C.; Nelson, Paul E.; and Stinnett, Donald F., to Raytheon Company. Apparatus for controllably stressing internal conductors of a closed device. 3,869,662, Cl. 324-34.00R.

Derner, William J., to FMC Corporation. Multiple seal carrier. 3,869,131, Cl. 277-21.000.

Deussner, Herbert, to Klockner-Humboldt-Deutz Aktiengesellschaft. Cooling pipe for use in satellite coolers of rotary kilns. 3,869,247, Cl. 432-80.000.

DeVincent, Patsy; and Steck, James R., to General Motors Corporation. Tube mounting assembly. 3,869,152, Cl. 285-137.00R.

De Vincent, Patsy; and Wiechart, John F., to General Motors Corporation. Double tube mounting assembly. 3,869,153, Cl. 285-137.00R.

De Witt, Robert; Jepson, Bernhart E.; and Schwind, Roger A., to United States of America, Atomic Energy Commission. Closed loop reflux system. 3,869,255, Cl. 23-263.000.

Dey, Ervin J., to Standard Pressed Steel Co. Barrel nut assembly. 3,868,806, Cl. 52-758.00F.

Dhingra, Ashok Kumar, to du Pont de Nemours, E. I., and Company. Preparation of flexible sheets of polycrystalline alumina-containing fibers. 3,869,339, Cl. 161-170.000.

Diamond Shamrock Corporation: *See*—
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Diekhoff, Hans H.: *See*—
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Dolgner, Darrel D., to United States of America, Army. Lanyard operated mechanical initiator. 3,869,315, Cl. 136-90.000.
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Doong, Henry; and Acuna, Mario H., to United States of America, National Aeronautics and Space Administration. Controllable high voltage source having fast settling time. 3,869,659, Cl. 321-15.000.
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Ekroos, Arne Olavi; Merikoski, Matti Kaarlo; and Levander, Bernhard Erik Oswald, to Oy Nobia AB. Tube made of metal strip by means of spiral seaming and a device intended for a spiral seaming tube machine for the production of such a tube. 3,868,840, Cl. 72-49.000.
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English, Donald Hugh. Well coupling and method of attaching the coupling of a well casing. 3,869,000, Cl. 166-315.000.
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Evans, James P. End wrench with ratcheting capabilities. 3,868,873, Cl. 81-119.000.

Evans, James P. Quick adjustable wrench. 3,868,875, Cl. 81-158.000.

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Fichtner, Rudi; and Lauckhardt, Gerhard, to USM Corporation. Method and apparatus for combined lasting of the toe, ball and shank areas of shoes. 3,868,737, Cl. 12-12.000.

Field, Jesse L., Jr.; and Medina, Glen J., to Caterpillar Tractor Company. Hydraulically actuated detent mechanism. 3,869,107, Cl. 251-94.000.

Finley, John W.; Hautala, Earl; and Walker, Charles E., to United States of America, Agriculture. Process for isolating oil-seed proteins using liquid fluorocarbons. 3,869,438, Cl. 260-123.500.

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Flavell, Evan R. Proportioned resistance exercise servo system. 3,869,121, Cl. 272-79.00R.

Fleming, Robert W.: *See—*
Andrews, Edwin R.; Claxton, George P.; Roberts, Edward McC.; and Fleming, Robert W., 3,869,496.

Flippen, George Burdine, Jr., to International Business Machines Corporation. Recording tape drive apparatus. 3,869,100, Cl. 242-201.000.

Floessel, Carl-Dieter: *See—*
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Floyd, Wallace C.; and Holcomb, Gregory W. Inspecting and stacking machine for containers. 3,869,042, Cl. 198-267.000.

FMC Corporation: *See—*
Derner, William J., 3,869,131.
Federspiel, Joseph A.; and Pawlowski, Edward W., 3,869,014.
Hardy, Donald, Sr., 3,869,540.

Focke, Heinz Hermann. Apparatus for alternately transferring groups of cigarettes to a rotary magazine via intermediate reciprocating chambers. 3,869,035, Cl. 198-24.000.

Foerster, George S., to N L Industries, Inc. Removal of nickel from molten magnesium metal. 3,869,281, Cl. 75-67.000.

Follette, Donald T. Air conditioning apparatus. 3,869,529, Cl. 261-130.000.

Fomicheva, Nina Petrovna: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leonid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Perepelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich, 3,869,592.

Fonne, Gunnar Johan; and Jahnsen, Thor Helge, to Norsk Hydro A.S. Antiskid agent for bags. 3,869,309, Cl. 117-138.800.

Foote, Danny R., to Berkley & Company, Inc. Flyline for fishing. 3,868,785, Cl. 43-44.980.

Ford Motor Company: *See—*
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Formo, Alvin C.: *See—*
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Fox, Harry; and Hardy, Alex, to Harco Products Inc. Cantilever deck structure. 3,868,797, Cl. 52-73.000.

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Frank, Mack, Jr. Shower bath caddy. 3,869,183, Cl. 312-248.000.

Frank W. Murphy Manufacturer, Inc.: *See—*
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Fredholm, Bo: *See—*
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 3,869,527.

Freed, Elisabeth H.; Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Dibenzobicycloalkane amines and related compounds. 3,869,512, Cl. 260-571.000.

Freed, Meier E.; and Childress, Scott J., to American Home Products Corporation. 1-adamantyl carbonyl-3,3-diphenylpiperazines. 3,869,460, Cl. 260-268.0PC.

Freed, Meier E.: *See—*
Freed, Elisabeth H.; Freed, Meier E.; and Potoski, John R., 3,869,512.

Freiberg, Leslie Alan, to Abbott Laboratories. Esters of erythromycin oxime. 3,869,444, Cl. 260-210.00E.

Fricke, Roy A. Spark plug cleaner. 3,868,790, Cl. 51-9.000.

Friedel, Rudolf; and Sedlatschek, Karl, to Siemens Aktiengesellschaft. Rotary anode for an x-ray tube. 3,869,635, Cl. 313-330.000.

Friese, Karl-Hermann; Michel, Friedbert; Krauss, Rudolf; Jaggle, Gunther; Stumpp, Gerhard; Steiner, Josef; and Knapp, Heinrich, to Robert Bosch G.m.b.H. Fuel injection system especially for cold starting and warming up externally ignited internal combustion engines. 3,868,939, Cl. 123-179.00L.

Frische, Dale George, to Indian Head Inc. Curing oven. 3,869,249, Cl. 432-121.000.

Frohberger, Paul-Ernst: *See—*
Widdig, Arno; Kuhle, Engelbert; Grewe, Ferdinand; Kaspers, Helmut; Scheinpflug, Hans; and Frohberger, Paul-Ernst, 3,869,503.

Fry, Timothy Selwyn, to Bartel Engineering Limited. Articulated vehicle coupling. 3,869,147, Cl. 280-438.00R.

Fryer, Rodney Ian: *See—*
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Fuhrmann, Manfred E. Fluid control mechanism for appliances. 3,868,968, Cl. 137-624.180.

Fuji Denki Seizo Kabushiki Kaisha: *See—*
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Fukushima, Osamu; Kogame, Kunio; and Sato, Masami, to Kuraray Co., Ltd. Flexible sheet materials. 3,869,310, Cl. 117-138.80A.

Fun and Frolic Incorporated: *See—*
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Funaishi, Kohtaro: *See—*
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Gage, Raymond T., to Ford Motor Company. Steering gear mounting. 3,869,139, Cl. 280-96.000.

Galey, Jean G.; and Bentz, Gerard, to L'Air Liquid, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method of electric refining of metals by slag, known as the E. S. R. method, using liquefied gas to isolate the slag and electrode from the ambient air. 3,868,987, Cl. 164-52.000.

Gallo, Charles F., to Xerox Corporation. Illumination source for xerographic exposure. 3,869,205, Cl. 355-67.000.

Gallo, Eugene, to United States of America, Navy. Aircraft barricade net erection system. 3,869,104, Cl. 244-110.00C.

Gallo, Mario. Method of fine adjusting balances and balance for performing this method. 3,869,004, Cl. 177-25.000.

Gallo, Thomas: *See—*
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Garcia Corporation: *See—*
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Gates, John I., to Oliver, Clifford C., a part interest. Window with extruded synthetic frame and method and apparatus for manufacture thereof. 3,868,789, Cl. 49-501.000.

Gaussoin, Julius; Nottingham, Robert B.; and Reichard, Robert E., to Silver Eagle Manufacturing Co., Inc. Spray suppressing device for a highway vehicle. 3,869,617, Cl. 290-1.00S.

Gay, Guy: *See—*
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Gaylor, Josephine. Exhaust gas filter. 3,869,267, Cl. 55-492.000.

Gaylord, Norman G., to Champion International Corporation. Styrene-maleic anhydride complex and process for making same. 3,869,432, Cl. 260-78.50R.

Gebhart, Howard C.: *See—*
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Gebler, Horst: *See—*
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Graveland, Antonie; Geerligs, Wouter Louis Prinsen; and Soleman, Mohamad Ali Arafien, 3,869,381.

Gelfand, Samuel: and Graham, John C., to Hooker Chemical & Plastics Corporation. Preparation of 3,5-dichlorobenzoyl chloride. 3,869,510, Cl. 260-544.00M.

Geller, Leo, to Ciba-Geigy Corporation. Injectable oily peptide preparations and processes for their manufacture. 3,869,549, Cl. 424-177.000.

Gelman, Alexandr Shmulievich: *See—*
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General Datacomm Industries, Inc.: *See—*
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General Electric Company: *See—*
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Georges, Louis W., to Firestone Tire & Rubber Company, The. Process of adhering polyester textile material to rubber and the products produced thereby. 3,868,985, Cl. 152-330.00R.

Gerard, William Allen, to Varian Associates. Triangular dither-tuned microwave tube. 3,869,638, Cl. 315-39.610.

Gerhart, James P. Automatic core loader. 3,869,046, Cl. 214-1.00R.

German, Vladimir Vladimirovich: *See—*
Koritsky, Andrei Vladimirovich; Ignatov, Viktor Alexandrovich; Polyak, Leonid Moiseevich; Shapiro, Semen Abramovich; Bokman, Grigory Aronovich; Mordvinov, Vladimir Alexandrovich; Zhizhin, Mikhail Ivanovich; Slonimsky, Alexandr Davydovich; Sevinian, Kimik Tigranovich; Adaskin, Semen Izrailovich; and German, Vladimir Vladimirovich, 3,869,628.

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Getz, Marvin G.; and Bentz, Erwin J. H., to Caterpillar Tractor Company. Gross flow cooling system. 3,868,992, Cl. 165-51.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
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Gilbank, Roland E., to PPG Industries, Inc. Loading rigid sheet materials. 3,869,053, Cl. 214-41.000.

Gillespie, Peter James, to Energy Conversion Limited. Vented electrochemical cells. 3,869,314, Cl. 136-86.00A.

Gillette Company, The: *See—*
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Givaudon Corporation: *See—*
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GKN Transmissions Limited: *See—*
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Glaxo Laboratories Limited: *See—*
Phillipps, Gordon Hanley; Newall, Christopher Earle; and Ayres, Barry Edward, 3,869,451.

Glifberg, Nils Bertil, to Svenska Sockerfabriks Aktiebolaget. Ball bearing. 3,869,182, Cl. 308-187.200.

Godowsky, Leopold S. Method of developing color film. 3,869,288, Cl. 96-22.000.

Godtfredsen, Wagn Ole, to Lovens Kemiske Fabrik Produktionsaktieselskab. New penicillin esters, salts thereof, and methods for their preparation. 3,869,449, Cl. 260-239.100.

Goldacker, Hubert; Hausberger, Helmut; and Schmieder, Helmut, to Gesellschaft fur Kernforshung mbH. Countercurrent extraction column for liquid-liquid extraction and simultaneous electrolysis. 3,869,374, Cl. 204-273.000.

Goldberg, Jack, to Monsanto Company. AC Responsive led pilot light circuitry. 3,869,641, Cl. 315-135.000.

Goldfarb, Irving: *See—*
Lippe, Joan M.; Goldfarb, Irving; and Jablon, Harry, 3,868,786.

Goodhue, Charles T.; and Risley, Hugh A., to Eastman Kodak Company. Method for the enzymatic hydrolysis of cholesterol esters. 3,869,349, Cl. 195-103.50R.

Goodrich, Joseph L.: *See—*
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Goossens, Walter; and Hermann, Wolfgang, to Eschweiler Bergwerks-Verein Aktiengesellschaft. Process for a thermal pretreatment of coking bituminous coal. 3,869,350, Cl. 201-32.000.

Gordon, Ronnie D., to Continental Oil Company. Process for dehydrohalogenation of trichloroethane to vinylidene chloride. 3,869,520, Cl. 260-654.00D.

Gorodetsky, Avram Shaevich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leonid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Perepelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich, 3,869,592.

Gotoda, Masao; Yokoyama, Kenji; Kono, Yoshimi; Toyonishi, Shigekazu; Hiwano, Kunio; and Shimoyama, Takaitsu, to Japan Atomic Energy Research Institute. Plywood comprising ionizing radiation cured cross-linked diallyl phthalate acrylonitrile polymer and method of making. 3,869,341, Cl. 161-270.000.

Goyheneix, Esteban Jose. Container for receptacles. 3,869,060, Cl. 220-19.000.

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Gradeff, Peter S.; and Bertrand, Claude, to Rhodia, Inc. Process for preparing hydroxy citronellal by saponification of the hydroxy ester. 3,869,517, Cl. 260-602.000.

Graetz, Ernest F. J., to Parke, Davis & Company. Multiple channel electrocardiograph. 3,868,948, Cl. 128-2.06G.

Graham, Donald E., to Valve Systems International, Inc. Welded valve body construction. 3,869,108, Cl. 251-366.000.

Graham, John C.: *See—*
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Graham, Roy R., to PPG Industries, Inc. Forming size for glass fibers and resulting product. 3,869,308, Cl. 117-126.0GB.

Gramlich, Donald L.; Jedele, Ormond J.; and Pearson, Robert M., to Ford Motor Company. Method of forming an insulated coil for a dynamoelectric machine. 3,868,766, Cl. 29-596.000.

Grant, Whitney I.: *See—*
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Graveland, Antonie; Geerligs, Wouter Louis Prinsen; and Soleman, Mohamad Ali Arafien, to Ingenieursbureau Dwars, Heederik en Verhey B.V. Process and apparatus for chemical conditioning of water. 3,869,381, Cl. 210-20.000.

Gravereaux, Daniel W.: *See—*
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Grawey, Charles E., to Caterpillar Tractor Company. Core mold and method for making same. 3,868,990, Cl. 164-369.000.

Gray, Michael J., to Gillette Company, The. Razor cartridge and adapter assembly. 3,868,772, Cl. 30-34.00R.

Great Lake Carbon Corporation: *See—*
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Grebene, Alan B., to Signetics Corporation. Phase locked loop with limited tracking range. 3,869,679, Cl. 331-8.000.

Grebtsov, Jury Grigorievich: *See—*
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Green, Paul F., to Sperry Rand Corporation. Controlled current vector generator for cathode ray tube displays. 3,869,085, Cl. 235-198.000.

Greenberg, Sanford D.: *See—*
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Greene, Gerald R., to Dow Badische Company. Device for presenting fibrous material for spectrophotometric analysis. 3,869,213, Cl. 356-244.000.

Greenspan, Harold Jack. Abrasive member. 3,869,263, Cl. 51-209.00R.

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Gregov, Stephen. Safety bumper for furniture. 3,869,106, Cl. 248-345.100.

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Griggs, David Thurston. Mechanical stenographic apparatus for transcribing group proceedings. 3,869,576, Cl. 170-1.0SE.

Grimes, Delmar C.; and Stocker, Raymond, to Ford Motor Company. Accelerator Pedal Assembly. 3,869,279, Cl. 74-513.000.

Grindstaff, Lloyd I.: *See—*
Shea, Frederick L.; Whittaker, Mack P.; and Grindstaff, Lloyd I., 3,869,302.

Grobe, Wolfgang, to International Standard Electric Corporation. Bistable latching relay. 3,869,684, Cl. 335-152.000.

Gruett, Monte D.: *See—*
Lesher, George Y.; and Gruett, Monte D., 3,869,464.

Grunert, Wilhelm; and Briotet, Jean Paul Francois Gilbert, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Fuel metering device especially for the combustion chamber of an aerojet engine. 3,868,971, Cl. 137-625.480.

Gruppo Lepetit S.p.A.: *See—*
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Grutzmann, Sigmar; Sailer, Heinz; and schollmeier, Gero, to Siemens Aktiengesellschaft. Arrangement for carrying signals. 3,869,670, Cl. 325-38.00A.

GTE Sylvania Incorporated: *See—*
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Guillot, Edmond P.: *See—*
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Gulf Oil Canada Limited: *See—*
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Gulf Oil Corporation: *See—*
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Gulf Research & Development Company: *See—*
Cahoy, Roger P.; and Sanjean, John, 3,869,497.

Gunkel, Walter A. System and apparatus for inspecting elongated welds. 3,868,847, Cl. 73-67.80S.

Guthrie, Robert William; and Kierstead, Richard Wightman, to Hoffmann-La Roche Inc. Amino citric acid derivatives. 3,869,407, Cl. 260-326.450.

Guthrie, Robert William; Kierstead, Richard Wightman; and LeMahieu, Ronald Andrew, to Hoffmann-La Roche Inc. 17-β-Hydroxy-17-α-methyl-5-α-androstano]3,2-c]or[2,3-d]isoxazoles. 3,869,467, Cl. 260-307.00D.

Gutzwiller, Juerg Albert Walter; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Intermediates for quinine, quinidine and derivatives thereof. 3,869,461, Cl. 260-284.000.

Gutzwiller, Juerg Albert Walter; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Processes and intermediates for quinine, quinidine, isomers and derivatives thereof. 3,869,462, Cl. 260-288.00R.

Guy Raymond Engineering Company Limited: *See—*
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Habayeb, Khaled M., to Wabash Alloys Inc. Method and apparatus for melting metals, especially scrap metals. 3,869,112, Cl. 266-33.00S.

Haberkorn, Otto, to Walther Buromaschinen GmbH. Value input mechanism for calculating machines. 3,869,081, Cl. 235-60.0TK.

Hackler, Ronald E.: *See—*
Taylor, Harold M.; Davenport, James D.; and Hackler, Ronald E., 3,869,456.

Hafner, Erich. Pallets. 3,868,915, Cl. 108-51.000.

Haggstrom, Rolf Paul; and Karlsson, Bengt-Ake, to AB Bojors. Weighing table particularly for a roller conveyor. 3,869,007, Cl. 177-211.000.

Hagman, Gustav Rune, to Monark-Crescent AB. Vaporizing burner device. 3,869,245, Cl. 431-326.000.

Hahn, Dulcie M.: *See—*
Rockland, Louis B.; Zaragosa, Eufrocina M.; and Hahn, Dulcie M., 3,869,556.

Halbeck, Werner B.: *See—*
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Hall, John B.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Novel fragrance materials. 3,869,411, Cl. 252-522.000.

Hall, John B.: *See—*
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Hallas, Robert; Tadanier, John Soloman; and VonEsch, Anne Mary, to Abbott Laboratories. 4''-O-sulfonyl erythromycin-9-O-oxime derivatives. 3,869,445, Cl. 260-210.00E.

Haller, John Jacob; and Silverman, Lawrence. Audio responsive apparatus for creating lighting effects. 3,869,699, Cl. 340-148.000.

Haller, William P; and Holka, Thomas C., to Ford Motor Company. Linear retractor. 3,869,173, Cl. 297-388.000.

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Hammond, Dean C., Jr.; and Matta, Galal N., to General Motors Corporation. Variable configuration combustion apparatus. 3,869,246, Cl. 431-351.000.

Hampton, Richard John; Shantz, John T.; Gallo, Thomas; and Unger, Peter, to Ogilvie Flour Mills Company, Limited, The. Process for making a free flowing flour. 3,869,558, Cl. 426-443.000.

Hanas, Bertil Henrik, to Allmanna Svenska Elektriska Aktiebolaget. Induction furnace for melt reduction. 3,869,560, Cl. 13-29.000.

Hanke, Martin; and Stiefken, Hans, to Telefunken Compter GmbH. Direct curent supply with ribble suppression. 3,869,658, Cl. 321-2.000.

Hanley, John F., Jr.: *See—*
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Hans und Heinrich Blum OHG: *See—*
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Hansson, Bror Olov Nikolaus; and Hertsius, Johan Olov Bror. Method of continuous casting molten copper in a seamless-pipe-shaped mould. 3,868,988, Cl. 164-69.000.

Harazono, Sinichi; and Morikawa, Toshinori, to Matsushita Electric Industrial Co., Ltd. Magnetic tape duplicating device. 3,869,710, Cl. 360-17.000.

Harco Products Inc.: *See—*
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Harding, Donald D., to Shropshire, Kenneth W. Adapter for mixing fluids. 3,868,967, Cl. 137-604.000.

Hardy, Alex: *See—*
Fox, Harry; and Hardy, Alex, 3,868,797.

Hardy, Donald, Sr., to FMC Corporation. Montmorillonite clay catalysts for the production of phosphonitrilic chloride. 3,869,540, Cl. 423-300.000.

Hare, Alan Lawrence: *See—*
New, George William; and Hare, Alan Lawrence, 3,869,593.

Hargrave, Robert W. Pool vacuum apparatus. 3,868,739, Cl. 15-1.700.

Harrison, Dean R.; and Dimeff, John, to United States of America, National Aeronautics and Space Administration. Diode-quad bridge circuit means. 3,869,676, Cl. 329-204.000.

Hart, John James: *See—*
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Hart, Milburn L.: *See—*
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Hart, Robert J.; and Hart, Milburn L., to Commercial Resins Company. Device for loading a plastic sleeve onto a mandrel. 3,868,895, Cl. 93-84.0TW.

Hartleroad, Ronald J.; and Grabowski, James P., to General Motors Corporation. Magnetic pre-alignment of semiconductor device chips for bonding. 3,868,759, Cl. 29-464.000.

Hartleroad, Ronald J.; and Grabowski, James P., to General Motors Corporation. Multiple magnetic alignment of semiconductor devices for bonding. 3,868,764, Cl. 29-589.000.

Hartleroad, Ronald J.; and Grabowski, James P., to General Motors Corporation. Laminated template for semiconductor device bonding. 3,868,765, Cl. 29-589.000.

Hartsough, Albert Charles: *See—*
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Hasegawa, Shin; and Brewster, Linda C., to United States of America, Agriculture. Limonoate dehydrogenase and preparation thereof. 3,869,345, Cl. 195-62.000.

Hashimoto, Shoji: *See—*
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Hausberger, Helmut: *See—*
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Hautala, Earl: *See—*
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Hauth, Jean-Marc; and Cheylac, Roland Claude Michel, to Pont-A-Mousson S.A. Self releasing brake device. 3,869,024, Cl. 188-72.500.

Hayward, Walter W. Burial vault. 3,868,799, Cl. 52-131.000.

Heaney, Donald T. Adjustable track assembly. 3,869,086, Cl. 238-10.00R.

Heath, Darrell R ; and Wirth, Joseph G., to General Electric Company. Bis(dicyanophenyl). ethers of dihydric phenols. 3,869,499, Cl. 260-465.00F.

Heath, James E.: *See—*
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Heath, Oran M. Fingered harmonicas. 3,868,881, Cl. 84-377.000.

Heberlein Hispano SA: *See—*
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Heeks, John Stuart; and Crisp, John Josiah, to International Standard Electric Corporation. Surface acoustic wave code generator. 3,869,682, Cl. 332-11.00R.

Heim, Peter: *See—*
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Heitmann, Hans-Gunther; and Donath, Gerhard, to Kraftwerk Union Aktiengesellschaft. Electromagnetic filter. 3,869,390, Cl. 210-222.000.

Hellman, Per Ingvar; Sondell, Jan Ivar; and Jershed, Bo Christian, to Stora Kopparbergs Bergslags Aktiebolag. Mould for manufacturing plastic articles, and method of manufacturing the mould. 3,869,318, Cl. 148-12.300.

Hellmer, Ernest W.; and Kinsley, John P., to Continental Can Company, Inc. Mold assembly. 3,869,237, Cl. 425-292.000.

Hellmuth, Walter W.: *See—*
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Henderson, Robert M.: *See—*
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Henry, Richard J.; and Cary, Robert A., to Teledyne Mid-America Corporation. Ferrous alloy and abrasive resistant articles made therefrom. 3,869,037, Cl. 198-37.000.

Heonis, Angelo Alexander. Instant beverage article. 3,869,555, Cl. 426-134.000.

Herbert Kannegiesser Kommanditgesellschaft: *See—*
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Herbert S. Fall: *See—*
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Herce, John A.; and Heath, James E., to Shell Oil Company. Method and apparatus for continuously separating emulsions. 3,869,408, Cl. 252-361.000.

Herluison, Jean-Claude: *See—*
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Hermann, Wolfgang: *See—*
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Hermet, Pierre; and Laesser, Rodolphe, to Compagnie Generale d'Electricite. Laser telemeter. 3,869,207, Cl. 356-4.000.

Herold, Hans: *See—*
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Hertsius, Johan Olov Bror: *See—*
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Herzog, Rollie R., to General Electric Company. Emergency lighting system using dim to bright flashing operation. 3,869,639, Cl. 315-86.000.

Hesener, Walter: *See—*
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Hickling, Colin D., to American Thermostat Corporation. Double acting snap switch. 3,869,690, Cl. 337-390.000.

Higo, Moriaki: *See—*
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Himstedt, Kurt, to Schmalbach-Lubeca-Werke Aktiengesellschaft. Easy opening closure for containers. 3,869,063, Cl. 220-270.000.

Hirai, Yoshio; and Yamamoto, Yoshimi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for burning materials of cement and the like. 3,869,248, Cl. 432-106.000.

Hirashima, Takashi: *See—*
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Hirose, Takeshi: *See—*
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Hobby, James L., deceased (Hobby, Thelma T., surviving spouse). Grove heater apparatus. 3,868,944, Cl. 126-59.500.

Hobby, Thelma T., surviving spouse: *See—*
Hobby, James L., deceased, 3,868,944.

Hobson, Charles F., Jr., to General Electric Company. Electrical protective panel assembly with sensitive ground fault protecting means. 3,869,649, Cl. 317-18.00D.

Hochstadt, Albert M. Manual character marking recognition system. 3,869,600, Cl. 235-61.12N.

Hoechst Aktiengesellschaft: *See—*
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Hoerner Waldorf Corporation: *See—*
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Hoffmann-La Roche Inc.: *See—*
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Hogan, Brian David; and Poole, Dennis Frederick, to Rabone Chesterman Limited. Housings. 3,869,096, Cl. 242-84.800.

Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, to Aktiebolaget Leo. Secondary phosphate esters. 3,869,527, Cl. 260-946.000.

Hogg, Dallas John Arthur: *See—*
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Hoh, George Lok-Kwong, to du Pont de Nemours, E. I., and Company. Reinforced wax compositions having universal adhesion. 3,869,416, Cl. 260-27.00R.

Holcomb, Gregory W.: *See—*
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Holka, Thomas C.: *See—*
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Holland, Douglas W. Air cushioned vehicle. 3,869,020, Cl. 180-120.000.

Holland, Gerald Fagan, to Pfizer Inc. Substituted benzoic acid hypolipemic agents. 3,869,553, Cl. 424-317.000.

Holopainen, Vesa: *See—*
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Holsinger, William P., to United States of America, Health, Education and Welfare. Concentric electrode construction for an electrocardiogram transmitter. 3,868,947, Cl. 128-2.06E.

Holthuis, Johannes Jacobus, to Nederlandese Industrie voor Baggerwerktuigen Nivoba N.V. Cylindrical rotor for use in a rasping machine. 3,868,751, Cl. 29-105.00R.

Homeier, Ronald F.: *See—*
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Hoover Company, The: *See—*
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Hoover, Richard B.; and Underwood, James H., to United States of America, National Aeronautics and Space Administration. Multiplate focusing collimator. 3,869,615, Cl. 250-508.000.

Hopkins, David Alan, to Valeron Corporation, The. Cutting tool. 3,868,752, Cl. 29-105.00A.

Hopkins, Gary L.: *See—*
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Hoppe, Peter; Leyer, Helmut; and Muller, Johann, to Bayer Aktiengesellschaft. Composite non-woven mats and foam plastic articles reinforced therewith. 3,869,337, Cl. 161-159.000.

Horst, Daniel R.; and Ingermann, Donald E., to Western Sales and Supply Co. Self-propelled automatic bowling lane maintenance machine. 3,868,738, Cl. 15-4.000.

Hostetler, Eldon, to Chore-Time Equipment, Inc. Weight controlled feeder system. 3,869,006, Cl. 177-60.000.

Hottenroth, Fred W.; and Hottenroth, Fred W., III. Portable forced draft solid fuel burning cooker. 3,868,943, Cl. 126-25.00R.

Hottenroth, Fred W., III: *See—*
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Hovel, Harold J.: *See—*
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Hughes, Nigel, to Imperial Chemical Industries Limited. 3-Secondary aminomethylene-4-lower-alkyl-5-azo-6-hydroxypyrid-2-one dyestuffs. 3,869,441, Cl. 260-156.000.

Hults, Harold W., to Cutter-Hammer, Inc. Double-pole tool handle switch. 3,869,590, Cl. 200-157.000.

Humphrey, Marion L.; and Tugaudis, Ernest A., to Allstate Insurance Company. Intrabuilding telephone system. 3,869,582, Cl. 179-98.000.

Hundstad, Richard L., to Westinghouse Electric Corporation. Vacuum interrupter including contacts having improved weld break characteristics. 3,869,589, Cl. 200-144.00B.

Hunt, Norman; and Noddings, John, to Associated Engineering Limited. Automatic transmission control systems. 3,868,869, Cl. 74-866.000.

Hunt, Robert F., to International Paper Company. Flexible ceramic member having a pre-loaded tensile force applying means. 3,869,344, Cl. 162-274.000.

Hunter, William L.; and Spanjer, Keith Gordon, to Motorola, Inc. Semiconductor device with dispersed glass getter layer. 3,869,704, Cl. 357-54.000.

Hunyar, Csaba K., to United Artists Music and Records Group, Inc. Ductility tester. 3,868,849, Cl. 73-100.000.

Hurley, James S. Medical electrode. 3,868,946, Cl. 128-2.10E.

Hutchinson, Gary Lee: *See—*
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Hutchison, John Blundell, to British Insulated Callender's Cables Limited. Cable glands. 3,869,155, Cl. 285-158.000.

Hyperion Incorporated: *See—*
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ICI Australia Limited: *See—*
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Iehl, William R., to Construction Machinery Company. Hauling hitch. 3,869,148, Cl. 280-457.000.

Igata, Toyonori, to Pioneer Electronic Corporation. Spindle adapter apparatus. 3,869,130, Cl. 274-10.00S.

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Improved Machinery Inc., 02: *See—*
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Inaga, Katsu, to Sony Corporation. Tape recording and/or reproducing apparatus and tape cassette for use therewith. 3,869,099, Cl. 242-199.000.

Indevco Corporation: *See—*
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Instance, David John, to David J. Instance Limited. Reeling self-adhesive labels. 3,869,328, Cl. 156-285.000.

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Ishihara, Joo; Kagohara, Hiromi; Nagai, Masaichi; and Ohuchi, Yasushi, to Hitachi, Ltd. Wear resistant deposited steel. 3,869,319, Cl. 148-31.500.
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Itoh, Takane, to Nissan Motor Company Limited. Automotive gas turbine engine. 3,868,818, Cl. 60-39.150.
Ivanov, Borislav S.; and Ivanova, Raina V. Multiplex typewriter for technical drawings. 3,869,033, Cl. 197-10.000.
Ivanova, Raina V.: *See*—
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Izdebski, Wladyslaw, to Schlage Lock Company. Removal of heavy metal ions from plating wastes. 3,869,386, Cl. 210-53.000.
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Jacquelin, Guy; and Sangenis, Solange, to Centre Technique de l'Industrie des Papiers Cartons et Celluloses. Application of precipitates of methylene-ureas and products obtained. 3,869,311, Cl. 117-155.00L.
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Jager, Gerhard; Metzger, Carl; Eue, Ludwig; and Schmidt, Robert, to Farbenfabriken Bayer Aktiengesellschaft. Esters. 3,869,490, Cl. 260-455.00A.
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James, Henry; and Johnson, Carl B., to Pontiac Furniture Industries, Inc. Locking mechanism for reclining chairs. 3,869,170, Cl. 297-270.000.
James, Henry; and Johnson, Carl B., to Pontiac Furniture Industries, Inc. Chair reclining mechanism. 3,869,172, Cl. 297-316.000.
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Janssen, Sylvain, to Compteurs Schlumberger. Volume gas meter. 3,868,852, Cl. 73-233.000.
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Jenkins, John C., to TRW Inc. Method for making an electrically-conductive connection specifically for underground lines. 3,869,361, Cl. 204-148.000.
Jenkins, John P., to International Tapetronics Corporation. Automatic sequence control for reproducing apparatus. 3,869,719, Cl. 360-72.000.
Jensen, Howard, to Ramby, Inc. Stair climbing tracked vehicle. 3,869,011, Cl. 180-9.240.
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Jones, Charles H., to United States of America, Navy. Scanning arrangement for sonar beams. 3,869,693, Cl. 340-6.00R.
Jones, Harold F.; Ousterling, David L.; and Anderson, Roland W., to Allied Chemical Corporation. Apparatus for automatic chemical processing of workpieces, especially semi-conductors. 3,869,313, Cl. 134-73.000.
Jones, Howard, to Merck & Co., Inc. Preparation of 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-indenyl-3-acetic acid. 3,869,507, Cl. 260-515.00A.
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Karl, Otto. Apparatus for mutually synchronizing oscillators in switching centers of a telecommunication network. 3,869,579, Cl. 179-15.0BS.
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Kato, Yoshio. Body treating apparatus. 3,868,950, Cl. 128-66.000.
Katsuma, Kunio, to USUI Kokusai Sangyo Kabushiki Kaisha. Corrosion-resistant composite coating to be formed on steel materials and method of forming the same. 3,869,261, Cl. 29-196.300.
Katsuyama, Harumi: *See*—
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Kavesh, Sheldon, to Union Carbide Corporation. Tubing for cryogenic use. 3,869,338, Cl. 161-165.000.
Kawada, Toshio; Torama, Tadashi; and Kobayashi, Tamio, to Matsushita Electric Industrial Company Limited. Magnetic recording and reproducing apparatus for multi-channel endless tape. 3,869,717, Cl. 360-60.000.
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Kawano, Hatsuo. Method of manufacturing a finned-tube heat exchanger. 3,868,754, Cl. 29-157.30A.
Kawasaki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Pattern identifying systems. 3,869,697, Cl. 340-146.30P.
Keene, Derek K.; and Roll, Louis C., to Eaton Corporation. Load extending mechanism for material handling vehicle. 3,869,047, Cl. 214-1.0BB.
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Keller, Robert A., to Echlin Manufacturing Company, The. Internal combustion engine with pressure responsive supercharger bypass. 3,868,822, Cl. 60-600.000.
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Kelly, George Bernard, Jr.; and Lowery, Robert Howard, to Union Carbide Corporation. Aqueous starch-pigment paper coating compositions containing glyoxal-urea insolubilizer. 3,869,296, Cl. 106-214.000.
Kelly, William F. Tendon gripping and release assembly. 3,868,748, Cl. 24-115.00M.
Kelly, William L., IV: *See*—
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Kennedy, Daniel W.; and Woodward, Walter R., to USM Corporation. Circuit for modifying a train of pulses. 3,869,656, Cl. 318-696.000.
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Kirton, John; Mears, Adrian Leonard; Sarginson, Richard William; and Werring, Norman John, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defense in Her Britannic Majisty's Government of the. Electroluminescent devices. 3,869,646, Cl. 315-246.000.

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Kishimoto, Shinzo: *See—*
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Kissner, Herbert G. Spare tire carrier, rear bumper and trailer hitch assembly for trucks. 3,869,075, Cl. 224-42.060.

Kita, Yasuo, to Sumitomo Electric Industries Ltd. Worn brake lining alarm circuit. 3,869,695, Cl. 340-52.00A.

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Klein, Burton. Dynamic arterial blood pressure simulator. 3,868,844, Cl. 73-4.00R.

Klein, Carl F.; Korta, Lawrence B.; and Bailey, James R., to Johnson Service Company. Microwave cavity oscillator having a frequency tuning element. 3,869,681, Cl. 331-96.000.

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Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leonid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Perepelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich, 3,869,592.

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Klomp, Edward D.; Wolgemuth, James H.; and Wiknich, Harold V., to General Motors Corporation. Rotary engine with auxiliary combustion chamber. 3,868,930, Cl. 123-8.130.

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Knapp, Isaac D., to PPG Industries, Inc. Method and apparatus for press shaping heat-softened sheets. 3,869,269, Cl. 65-106.000.

Knappe, Heinrich; Nolte, Karl-Heinz; and Kempelmann, Reinhold, to Herbert Kannegiesser Kommanditgesellschaft. A process for folding shirts or similar articles of clothing for packing. 3,869,073, Cl. 223-37.000.

Knecht Filterwerke Gesellschaft mit beschrankter Haftung: *See—*
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Knopf, Karl Horst. Rechargeable aerosol-type dispensing device for whipped cream. 3,868,978, Cl. 141-19.000.

Kobayashi, Tamio: *See—*
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Kocher, Erich J.; and Grant, Whitney I., to Vilter Manufacturing Corporation. Variable capacity rotary screw compressor having variable high pressure suction fluid inlets. 3,869,227, Cl. 418-15.000.

Kochetkov, Valentin Mikhailovich: *See—*
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Koenig, Carl F., III, to Warner & Swasey Company, The. Spindle clamp. 3,869,002, Cl. 173-166.000.

Kogame, Kunio: *See—*
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Koh, Hyung Chan. Hair supporting element for a weftless or regular wig. 3,868,959, Cl. 132-53.000.

Kohler, Oscar: *See—*
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Kohori, Kiyotaka. Golf-shot practicing apparatus. 3,869,127, Cl. 273-195.00B.

Kolensky, Leo Michael; Pile, Randolph John; Schlanger, Gabriel Gary; and Willand, Allan Howard, to Bell Telephone Laboratories, Incorporated. Multipoint junction unit providing exclusive interconnections of branch pairs. 3,869,573, Cl. 178-73.000.

Kolomyjec, Taras Avenir. Power supply arrangement for fluorescent tubes, thermionic devices and the like. 3,869,640, Cl. 315-97.000.

Kominami, Naoya; Nakajima, Hitoshi; Miyata, Seiji; Kimura, Takeo; Chono, Masazumi; and Sakurai, Tokio, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the production of unsaturated aliphatic nitriles. 3,869,500, Cl. 260-465.300.

Kondo, Asaji; Kishimoto, Shinzo; Yazawa, Kenichiro; Miyano, Shizuo; and Honjo, Satoru, to Fuji Photo Film Co., Ltd. Plate-making master and method for producing a printing plate which does not require dampening water. 3,869,285, Cl. 96-1.00R.

Konieczynski, Ronald D., and Springmeyer, Allan H., to General Electric Company. Rotating x-ray target with toothed interface. 3,869,634, Cl. 313-330.000.

Kono, Yoshimi: *See—*
Gotoda, Masao; Yokoyama, Kenji; Kono, Yoshimi; Toyonishi, Shigekazu; Hiwano, Kunio; and Shimoyama, Takaitsu, 3,869,341.

Konon, Jury Alexeevich: *See—*
Apalikov, Jury Ignatievich; Bankovsky, Leonid Leonidovich; Gelman, Alexandr Shmulievich; Konon, Jury Alexeevich; Pervukhin, Leonid Borisovich; Tsemakhovich, Boris Davydovich; Bronovsky, Grigory Abramovich; Poretskin, Vitaly Moiseevich; Tokarev, Petr Pavlovich; and Barinov, Boris Agafonovich, deceased, 3,868,761.

Konopka, Edward J.; and Fisher, Conan F., Jr., to Fun and Frolic Incorporated. Solar heater for swimming pools. 3,868,945, Cl. 126-271.000.

Koponen, Martti: *See—*
Soininen, Mauri; Koponen, Martti; and Holopainen, Vesa, 3,868,780.

Korda, Peter Bela, to RCA Corporation. Recovery of normally illegible, magnetically recorded information. 3,869,721, Cl. 360-77.000.

Koritsky, Andrei Vladimirovich; Ignatov, Viktor Alexandrovich; Polyak, Leonid Moiseevich; Shapiro, Semen Abramovich; Bokman, Grigory Aronovich; Mordvinov, Vladimir Alexandrovich; Zhizhin, Mikhail Ivanovich; Slonimsky, Alexandr Davydovich; Sevintan, Kimik Tigranovich; Adaskin, Semen Izrailovich; and German, Vladimir Vladimirovich. Electric machine stator. 3,869,628, Cl. 310-179.000.

Korkut, Mehmet D. Method of orthogonally connecting long structural members of circular and rectangular cross-section. 3,868,760, Cl. 29-470.000.

Korta, Lawrence B.: *See—*
Klein, Carl F.; Korta, Lawrence B.; and Bailey, James R., 3,869,681.

Kotzsch, Hans-Joachim; Amort, Jurgen; Junger, Hans; Nestler, Heinz; and Weissenfels, Franz, to Dynamit Nobel Aktiengesellschaft. Phosphorus organosilane adhesives. 3,869,340, Cl. 161-182.000.

Kowa Yakuhin Kogyo Kabushiki Kaisha: *See—*
Shindo, Hideyasu; Kumagai, Toshio; and Dot, Kengo, 3,869,477.

Kraftwerk Union Aktiengesellschaft: *See—*
Heitmann, Hans-Gunther; and Donath, Gerhard, 3,869,390.
Losel, Georg; and Eickenberg, Leonhard, 3,868,927.

Kramer, William L., to General Motors Corporation. Magnetic drain plug assembly. 3,869,391, Cl. 210-222.000.

Kranz, Vladimir, to Steinhof Marketing Corporation Ltd., represented by the General Partners, Steinhof Associated GmbH. Device for protecting coverings of inflatable tennis halls. 3,869,118, Cl. 272-3.000.

Krapcho, John, to E. R. Squibb & Sons, Inc. 2,3,4,5-Tetrahydro-4-phenyl-1H-1,4-benzodiazepine-1-carboximidamide and related compounds. 3,869,447, Cl. 260-239.0BD.

Krauss, Rudolf: *See—*
Friese, Karl-Hermann; Michel, Friedbert; Krauss, Rudolf; Jaggle, Gunther; Stumpp, Gerhard; Steiner, Josef; and Knapp, Heinrich, 3,868,939.

Krikau, Frederick G.: *See—*
Allen, John E.; Hanley, John F., Jr.; Armdur, Frank K.; Krikau, Frederick G.; and Patton, Richard S., 3,869,352.

Kring, Peder Lund; and Lund, Jorgen, to A/S Ferrosan. Preparations containing fat-soluble vitamins in dry, particulate, free-flowing form dispersible in cold water and method of producing such preparations. 3,869,539, Cl. 424-236.000.

Kroeker, Elmer Leroy Bob, to International Business Machines Corporation. Decreasing load deflection mechanism. 3,869,116, Cl. 271-160.000.

Krzewinski, Henrietta K., to Johnson & Johnson. Surgical gown. 3,868,728, Cl. 2-114.000.

KSB Kernkraftwerkspumen GmbH: *See*—
Diederich, Herbert, 3,869,135.

Kubota, Kanemitsu, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal display device. 3,869,196, Cl. 350-160.0LC.

Kucaba, Walter: *See*—
Thies, Peter Willibrord; Kucaba, Walter; and Funke, Siegfried, 3,869,476.

Kugele, Thomas G.; and Bresser, Robert E., to Cincinnati Milacron Chemicals, Inc. Alkyltin polysulfide thioesters. 3,869,487, Cl. 260-429.700.

Kugler, Tibor, to Lonza, Ltd. Apparatus for carrying out high temperature reactions. 3,869,254, Cl. 23-262.000.

Kuhle, Engelbert; and Klauke, Erich, to Bayer Aktiengesellschaft. N-alkyl-N(trihalomethylthio)-sulfamic acid chloride. 3,869,509, Cl. 260-543.00R.

Kuhle, Engelbert: *See*—
Widdig, Arno; Kuhle, Engelbert; Grewe, Ferdinand; Kaspers, Helmut; Scheinpflug, Hans; and Frohberger, Paul-Ernst, 3,869,503.

Kuhn, Ralph F., Jr.: *See*—
United States of America, National Aeronautics and Space Administration; and Kuhn, Ralph F., Jr., 3,869,151.

Kuhnle, Ernst; and Schwarz, Josef, to Bizerba-Werke Wilhelm Kraut K.G. Balance scale. 3,869,008, Cl. 177-217.000.

Kuhnle, Ernst, to Bizerba-Werke Wilhelm Kraut K.G. Scale. 3,869,009, Cl. 177-217.000.

Kumagai, Toshio: *See*—
Shindo, Hideyasu; Kumagai, Toshio; and Dot, Kengo, 3,869,477.

Kumagai, Yasuhiko: *See*—
Shiraishi, Satoshi; Fujiwara, Kunio; Kumagai, Yasuhiko; and Kurosaki, Shiro, 3,869,194.

Kume, Takeshi, to Ryuichi Mujamoto. Belt conveyor apparatus. 3,869,574, Cl. 198-203.000.

Kunath, Paul: *See*—
Vorster, Hans-Jurgen; Kunath, Paul; and Bethmann, Karl-Wilhelm, 3,869,379.

Kunio, Shibayama, to Fuji Denki Seizo Kabushiki Kaisha. Sliding shoe in vehicular pantagraph collector. 3,869,029, Cl. 191-49.000.

Kunst, Matthias: *See*—
Schacher, Hans-Dieter; Fischer, Reinhold; and Kunst, Matthias, 3,869,373.

Kuraray Co., Ltd.: *See*—
Fukushima, Osamu; Kogame, Kunio; and Sato, Masami, 3,869,310.

Kureka Kagaku Kogyo K.K.: *See*—
Yoshikawa, Shinsuke; Sasaki, Tohru; Ota, Mitsuru; Terasaki, Shuji; and Funakoshi, Akira, 3,869,534.

Kurelek, John; and Locker, Victor E., to Kochring Company. Method of harvesting and accumulating trees. 3,868,982, Cl. 144-309.0AC.

Kurio, Noriyuki, to Toyo Kogyo Co., Ltd. Sealing device for use in rotary piston engine. 3,869,229, Cl. 418-142.000.

Kurosaki, Shiro: *See*—
Shiraishi, Satoshi; Fujiwara, Kunio; Kumagai, Yasuhiko; and Kurosaki, Shiro, 3,869,194.

Kurz, German: *See*—
Von Linde, Robert; Von Linde, Joachim; and Kurz, German, 3,869,244.

Kushida, Toshimoto; and Logothetis, Eleftherios M., to Ford Motor Company. Circuit for converting a temperature dependent input signal to a temperature independent output signal. 3,868,846, Cl. 73-27.00R.

Labtronic, AG: *See*—
Egli, Bruno; and Manser, Niklaus, 3,869,214.

Laesser, Rodolphe: *See*—
Hermet, Pierre; and Laesser, Rodolphe, 3,869,207.

L'Air Liquid, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Galey, Jean G.; and Bentz, Gerard, 3,868,987.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude: *See*—
Roussel, Jacques; and Perrin, Georges, 3,869,090.

Laktionov, Vladimir Sergeevich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leonid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Percpelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich, 3,869,592.

La Marre, David A.; Smith, Donald A.; and Stickney, Herbert F., to American Optical Corporation. Welding helmet. 3,868,726, Cl. 2-8.000.

Lambert, Everette M.; and Ball, Richard L., to Drake, Crandell & Batchelder. Water tight seaming of flexible thermoplastic sheet material. 3,869,327, Cl. 156-256.000.

Lambert, Ronald D.; and Bradford, Jack R., to Herbert S. Fall. Two-way travel front panel. 3,869,184, Cl. 312-330.000.

Lambiris, Theodore, to General Motors Corporation. Gearshift indicator arrangement. 3,868,923, Cl. 116-124.00R.

Landers, Don B., to Oil States Rubber Company. Clustered and protected pressure lines for setting sleeve packers. 3,868,826, Cl. 61-46.500.

Lang, Gerard; and Bugaut, Andree, to Societe Anonyme dite: L'Oreal. Novel diazamerocyanines and their use for dyeing keratinous fibers. 3,869,454, Cl. 260-244.00R.

Langlois, Darwin James, to du Pont de Nemours, E. I., and Company. Process for gold precipitation. 3,869,280, Cl. 75-.50A.

Lanier, Carroll W.; and Kao, James T. F., to Ethyl Corporation. Phosphonitrile polymer. 3,869,294, Cl. 106-15.0FP.

Lanthiez, Jacques: *See*—
Dosdat, Jean; Lanthiez, Jacques; and Levaire, Claude, 3,868,769.

La Roche, Louis A., to Ford Motor Company. Deck lid latch and lock assembly. 3,868,836, Cl. 70-240.000.

Larson, Robert C., to GTE Sylvania Incorporated. Heater for vacuum tube cathode in which the wire of the heater legs has been etched to reduce its diameter. 3,869,692, Cl. 338-296.000.

Lasky, Mervyn C. Removable dental bridge and method for making same. 3,868,776, Cl. 32-5.000.

Lauckhardt, Gerhard: *See*—
Fichtner, Rudi; and Lauckhardt, Gerhard, 3,868,737.

Lavery, Lawrence Phillip: *See*—
Mason, Peter John; Hutchinson, Gary Lee; Lavery, Lawrence Phillip; Punt, Vernon Edmund; and Rivers, Roy Wilben, 3,869,569.

Lawrence, Glen S., to United Aircraft Corporation. Filament for electron guns. 3,869,636, Cl. 313-341.000.

Lawrence Peska Associates, Inc.: *See*—
Danylewich, David S., 3,869,200.

Lawson, Joseph M. Pump control means. 3,868,820, Cl. 60-382.000.

Lax, Benjamin; and Aggarwal, Roshan L., to Massachusetts Institute of Technology. High-power tunable far-infrared and submillimeter source. 3,869,618, Cl. 307-88.300.

Lea-Ronal, Inc.: *See*—
Nobel, Fred I.; and Ostrow, Barnet D., 3,869,358.

Leahy, Richard M., to Beatrice Foods Co. Truck for loading oven compartments. 3,869,052, Cl. 214-38.00B.

Lear, Joseph D., to Posting Equipment Corporation. Posting trays. 3,869,045, Cl. 211-11.000.

Le Floch, Yann: *See*—
Nguyen-Tat, Thang; Pain, Roger Andre; Le Floch, Yann; and Herluison, Jean-Claude, 3,869,570.

Leggett, Norman Derek: *See*—
Backhouse, Geoffrey Howard; and Leggett, Norman Derek, 3,869,702.

Lehmann, Ernest H., to Xerox Corporation. Color electrophotographic printing machine. 3,869,203, Cl. 355-4.000.

Leicht, Alfred: *See*—
Buttel, Helmut; Isert, Ingo Rudiger; Leicht, Alfred; and Schach, Albert, 3,869,685.

Leimbach, Richard C.: *See*—
Eyerdam, Homer F.; and Leimbach, Richard C., 3,869,072.

Leining, Lyndon R., to Geo. A. Hormel & Co. Dispensing apparatus. 3,868,979, Cl. 141-159.000.

LeMahieu, Ronald Andrew: *See*—
Guthrie, Robert William; Kierstead, Richard Wightman; and LeMahieu, Ronald Andrew, 3,869,467.

Lenhard, Myron J., to Xerox Corporation. Copy apparatus with means to effect visible ray imaging and infrared ray transfixing. 3,869,612, Cl. 250-319.000.

Lentz, Carl A., to General Motors Corporation. Transmission control system. 3,868,866, Cl. 74-752.00C.

Lesher, George Y., to Sterling Drug Inc. N,N′-Heptamethylenebis(4-trifluoromethoxybenzamide)-β-cyclodextrin inclusion complex. 3,869,443, Cl. 260-209.00R.

Lesher, George Y.; and Gruett, Monte D., to Sterling Drug Inc. Preparation of 1-alkyl-1,4-dihydro-7-substituted-4-oxo-1,8-naphthyridine-3-carboxylic acids via the 3-hydroxymethyl analogs. 3,869,464, Cl. 260-295.50B.

Levaire, Claude: *See*—
Dosdat, Jean; Lanthiez, Jacques; and Levaire, Claude, 3,868,769.

Levander, Bernhard Erik Oswald: *See*—
Ekroos, Arne Olavi; Merikoski, Matti Kaarlo; and Levander, Bernhard Erik Oswald, 3,868,840.

Levey, John S.; Miller, Sandra R.; and Levey, Robert F., to Days-Ease Home Products Corporation. Suspended dissoluble disinfectant container. 3,869,069, Cl. 222-180.000.

Levey, Robert F.: *See*—
Levey, John S.; Miller, Sandra R.; and Levey, Robert F., 3,869,069.

Levine, Alfred A.: *See*—
Richter, Sidney B.; and Levine, Alfred A., 3,869,471.

Lewis, Almor. Cooking apparatus. 3,868,942, Cl. 126-25.00R.

Leybold-Heraeus Verwaltung GmbH: *See*—
Ruus, Waldemar; and Stephan, Herbert, 3,869,232.

Leyer, Helmut: *See*—
Hoppe, Peter; Leyer, Helmut; and Muller, Johann, 3,869,337.

Lhonore, Pierre; Cohen, Guy; and Jacquinot, Bernard, to Societe Chimique de la Grande paroisse, Azote et produits Chimiques. Apparatus for producing nitroparaffins. 3,869,253, Cl. 23-260.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Minner, Willy, 3,869,623.

Liebman, Bernard; and Rucinski, David W., to General Motors Corporation. Automatic choke. 3,868,935, Cl. 123-119.00F.

Light, Kenneth K.; and Anglim, James Brian, to International Flavors & Fragrances Inc. Process for the production of hexamethylbenzene. 3,869,524, Cl. 260-671.00M.

Lindsay, David Gordon; and Shall, Sydney, to National Research Development Corporation. Mono-, di, and N_{A1}, N^{B1}, N^{B29}-tri-acylated insulin. 3,869,437, Cl. 260-112.700.

Lindsey, David M., to General Motors Corporation. Composite sliding member. 3,869,259, Cl. 29-182.800.

Linfoot, Bryan Crosby: *See—*
Puttock, Michael Charles; and Linfoot, Bryan Crosby, 3,869,626.

Linhardt, Hans D.; Carter, Thomas A.; and Kirk, James A., to Airco, Inc. Air cycle food freezing system and method. 3,868,827, Cl. 62-63.000.

Link, William T.; and McClatchie, Edward A., to Akron Scientific Labs. Infrared gas analyzers. 3,869,613, Cl. 250-343.000.

Lippe, Joan M.; Goldfarb, Irving; and Jablon, Harry. Belt or collar with runner track. 3,868,786, Cl. 46-51.000.

LKG-produkter AB: *See—*
Sunden, Bengt Fritiof, 3,869,365.

Locke, Frank K.: *See—*
Piper, Robert J.; and Locke, Frank K., 3,869,038.

Locker, Victor E.: *See—*
Kurelek, John; and Locker, Victor E., 3,868,982.

Loev, Bernard: *See—*
Mechoulam, Raphael; Houry, Shlomo; and Loev, Bernard, 3,869,475.

Loew, Theodore, to Standard Products Co., The. Auto trim. 3,869,332, Cl. 161-31.000.

Logothetis, Eleftherios M.: *See—*
Kushida, Toshimoto; and Logothetis, Eleftherios M., 3,868,846.

Logvinenko, Dmitry Danilovich: *See—*
Tsantker, Karl Lazarevich; Logvinenko, Dmitry Danilovich; Shelyakov, Oleg Parfirovich; Verich, Vadim Pavlovich; Skrypnik, Alexandr Vasilievich; and Shishkov, Nikolai Ivanovich, 3,869,251.

Long, Donald Charles; Hartsough, Albert Charles; and Sanford, Robert Fincher, to Princeton Electro Dynamics, Inc. Solid state, controllable electric switch. 3,869,651, Cl. 317-155.500.

Long, Kenneth E.; and Taylor, David W., to Nico Magnetics Inc. Method of making a thin, flexible magnetic memory layer. 3,869,356, Cl. 204-38.00R.

Longley, Kermit D.; and Sprowl, Donald, to Witco Chemical Corporation. Process of producing adipic acid. 3,869,508, Cl. 260-531.00R.

Longman, Millard Dumas, Jr., to Coulter Electronics, Inc. Method for designing an integrating circuit with a finite memory and the resultant apparatus. 3,869,084, Cl. 235-183.000.

Lonza, Ltd.: *See—*
Kugler, Tibor, 3,869,254.

Lorch Electronics Corporation: *See—*
Snyder, Richard V., 3,869,585.

Lorenz, Gerhard, to Sartorius-Membranfilter GmbH. Particle-size spectrometers. 3,869,208, Cl. 356-102.000.

Losel, Georg; and Eickenberg, Leonhard, to Kraftwerk Union Aktiengesellschaft; and Borsig GmbH. Combustion chamber. 3,868,927, Cl. 122-240.00R.

Loshbough, Richard C.: *See—*
Williams, Roger B., Jr.; Loshbough, Richard C.; and Pryor, Edward G., 3,869,005.

Louis, Meelis Nicolaus: *See—*
Van den Boogaart, Krijn; and Louis, Meelis Nicolaus, 3,869,486.

Loveland, Malcolm W., to Atlas Pacific Engineering Company. Machine for seed celling previously cored apples. 3,869,041, Cl. 198-259.000.

Lovens Kemiske Fabrik Produktionsaktieselskab: *See—*
Godtfredsen, Wagn Ole, 3,869,449.

Lowery, Robert Howard: *See—*
Kelly, George Bernard, Jr.; and Lowery, Robert Howard, 3,869,296.

Lucas Aerospace Limited: *See—*
Collins, Keith Douglas, 3,869,645.

Ludin, Ludwig, to Camille Bauer Messinstrumente AG. Data storage and retrieval system. 3,869,082, Cl. 235-61.11H.

Lummus Company, The: *See—*
Sze, Morgan C.; and Wang, Ruey H., 3,869,518.

Lund, Jorgen: *See—*
Kring, Peder Lund; and Lund, Jorgen, 3,869,539.

Lund, Lloyd J., to Cutter Laboratories, Inc. Adjuvant compositions and medicinal mixtures comprising them. 3,869,546, Cl. 424-88.000.

Lutz, Albert William; and Walworth, Bryant Leonidas, to American Cyanamid Company. 2,3,5-Substituted-6-trifluoromethyl-1,3-diazin-4-ones. 3,869,457, Cl. 260-260.000.

Lybarger, James H.; Scheuerman, Ronald F.; and Karnes, George Thomas, to Shell Oil Company. Buffer-regulated treating fluid positioning process. 3,868,996, Cl. 166-250.000.

Lybarger, James H.; Scheuerman, Ronald F.; and Karnes, George Thomas, to Shell Oil Company. Self-acidifying treating fluid positioning process. 3,868,998, Cl. 166-278.000.

Lynam, John Edward, to Automatic Braiding Company (Nottingham) Limited. Composite elastic bands and garments incorporating such bands. 3,868,729, Cl. 2-237.000.

Lynch, Don Murl: *See—*
Crovetti, Aldo Joseph; Kenney, Donald Sykes; Lynch, Don Murl; and Stein, Robert George, 3,869,274.

Lysle, Gordon. Photoplastic film microfiche including a protective cover. 3,869,201, Cl. 353-120.000.

Machanian, William V.: *See—*
Wheelwright, Robert W.; and Machanian, William V., 3,869,032.

Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Yotumoto, Keiichi; and Sunaga, Hiromi, to Ebara Manufacturing Co., Ltd.; and Japan Atomic Energy Research Institute. Process for removing noxious gas pollutants from effluent gases by irradiation. 3,869,362, Cl. 204-157.10R.

Mackey, E. Scudder; and Neschleba, Albert J., to GAF Corporation. Method for making antihalation layer. 3,869,402, Cl. 252-300.000.

Mackie, John K. P.; and McMeekin, Samuel, to James Mackie & Sons Limited. Plastic films. 3,869,240, Cl. 425-374.000.

MacRitchie, Norman: *See—*
Seymour, David Jackson; MacRitchie, Norman; Matthews, Parker J.; and Clark, Thomas A., 3,868,921.

MacWilliam, Joseph Anthony: *See—*
Hughes, John Thomas; and MacWilliam, Joseph Anthony, 3,869,334.

Maddox, Edward L.; and Pease, Robert A., to Teledyne, Inc. Audio dosimeter. 3,868,857, Cl. 73-558.000.

Mader, Helmut; Otto, Rigobert; Marx, Paul; and Puschel, Walter, to Agfa-Gevaert Aktiengesellschaft. Silver halide light-sensitive color photographic material containing color coupler masking compound and development inhibitor releasing compound. 3,869,291, Cl. 96-100.000.

Madison-Kipp Corporation: *See—*
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Magnavox Company: *See—*
Close, Ernest Frederick, 3,869,673.

Magne, Frank C.: *See—*
Mod, Robert R.; Magne, Frank C.; Skau, Evald L.; and Sumrell, Gene, 3,869,483.

Mahoney, Donald Edwin, to RCA Corporation. Multiple transistor microwave amplifier. 3,869,678, Cl. 330-53.000.

Maier, Alfred E.; and Rexroad, James O., to Westinghouse Electric Corporation. Circuit breaker with pre-loaded terminal connectors. 3,869,192, Cl. 339-147.000.

Maillot, Jean Paul, to International Standard Electric Corporation. Metal oxide dielectric layers for capacitors. 3,869,652, Cl. 317-230.000.

Maio, Kenji, to Hitachi, Ltd. Discharge luminescence element array having a gas flow path. 3,869,630, Cl. 313-188.000.

Malmon, Arthur G. Methods and apparatus for determining the number of objects in an assemblage. 3,869,083, Cl. 235-92.0PC.

Malygin, Petr Vasilievich; Kochetkov, Valentin Mikhailovich; and Tolkachev, Alexei Efimovich. Electropneumatic valve. 3,868,966, Cl. 137-596.160.

Manabe, Yukihiro: *See—*
Suzuki, Tameyuki; Yasukawa, Junichi; Ishii, Teruhiko; Minami, Giiichi; Manabe, Yukihiro; and Nishimura, Mitsuo, 3,869,366.

Mann, Leonard J.; and Kemper, John A., to General Motors Corporation. Insulation divider for refrigerator cabinet. 3,868,829, Cl. 62-285.000.

Manser, Niklaus: *See—*
Egli, Bruno; and Manser, Niklaus, 3,869,214.

Marathon Oil Company: *See—*
Pogers, Richard J., 3,868,997.

Marchetti, Enzo, to Instituto Farmacologico Serono S.p.A. Pyrrolidides and morpholides of 4,5-diphenyl-oxazole-2-alkanoic acids. 3,869,455, Cl. 260-247.50E.

Marion, Charles P.; Schlinger, Warren G.; Brent, Albert; and Muenger, James R., to Texaco Inc. Gas turbine process utilizing purified fuel gas. 3,868,817, Cl. 60-39.020.

Mark, Carol A.: *See—*
Mark, Victor; and Mark, Carol A., 3,869,491.

Mark, Victor; and Mark, Carol A., to Hooker Chemicals & Plastics Corporation. Halosulfonyl sulfooxonium compounds. 3,869,491, Cl. 260-457.000.

Markwort, Helmut: *See—*
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Martin, Clifford E.: *See—*
Trost, Edward; and Martin, Clifford E., 3,869,698.

Maruoka, Yasuro: *See—*
Sawada, Yuji; Takemoto, Katsumi; and Maruoka, Yasuro, 3,869,028.

Marx, Joachim. Producing protective coatings on metal. 3,869,317, Cl. 148-6.15R.

Marx, Paul: *See—*
Mader, Helmut; Otto, Rigobert; Marx, Paul; and Puschel, Walter, 3,869,291.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Glass fiber reinforced elastomers. 3,869,306, Cl. 117-72.000.

Masaki, Noriyasu, to Soryu Sewing Machine Mfg. Co., Ltd., The. Sewing machine clutch. 3,869,030, Cl. 192-67.00R.

Mason, Peter John; Hutchinson, Gary Lee; Lavery, Lawrence Phillip; Punt, Vernon Edmund; and Rivers, Roy Wilben, to Xerox Corporation. Facsimile transceiving apparatus. 3,869,569, Cl. 178-7.600.

Massachusetts Institute of Technology: *See—*
Lax, Benjamin; and Aggarwal, Roshan L., 3,869,618.
Wilson, Gerald L., 3,869,621.

Massey-Ferguson Inc.: *See—*
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Mueller, Otto, Jr., 3,869,001.

Mast, John G.: *See—*
Bierman, Howard R.; and Mast, John G., 3,868,973.

Masuzawa, Isao; Onishi, Kazutoshi; and Awano, Tsuneo, to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.). On-off control device for DC electric motor. 3,869,653, Cl. 318-364.000.

Mathais, Henri: *See*—
Weiss, Francis; Schirmann, Jean-Pierre; and Mathais, Henri, 3,869,541.

Matheson, Donald L. Power gate and lift means. 3,869,168, Cl. 296-56.000.

Matheson, Wilfrid G.: *See*—
Anderson, Warren A.; Passmore, Edmund M.; and Matheson, Wilfrid G., 3,869,631.

Mathias, Joseph S., to Sperry Rand Corporation. Method for making a magnetic wire of iron and nickel on a copper base. 3,869,355, Cl. 204-32.00R.

Mathis, Thomas C.; and Morgan, Albert W., to Monsanto Company. Smoke-retardant halogen-containing polymer systems. 3,869,420, Cl. 260-30.60R.

Matsukawa, Hirohara; and Saeki, Keiso, to Fuji Photo Film Co., Ltd. Process for preparing microscopic capsules. 3,869,406, Cl. 252-316.000.

Matsuoka, James T., to Intercole Automation, Inc. Apparatus for mixing rubber, elastomer, plastic and the like. 3,869,111, Cl. 259-192.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Harazono, Sinichi; and Morikawa, Toshinori, 3,869,710.
Kawada, Toshio; Torama, Tadashi; and Kobayashi, Tamio, 3,869,717.
Sezaki, Nobuhiko; and Ukena, Kohji, 3,869,602.

Matsushita Electric Works, Ltd.: *See*—
Shoji, Magozo; and Kitamura, Motoharu, 3,869,657.

Matta, Galal N.: *See*—
Hammond, Dean C., Jr.; and Matta, Galal N., 3,869,246.

Matter, Robert C., to General Motors Corporation. Alloy for through-the-partition intercell connectors formed by an extrusion-fusion technique. 3,869,316, Cl. 136-134.000.

Matthews, Larry S.: *See*—
Kaufer, Herbert; Matthews, Larry S.; Sonstegard, David A.; and Murray, Ian P., 3,868,730.

Matthews, Parker J.: *See*—
Seymour, David Jackson; MacRitchie, Norman; Matthews, Parker J.; and Clark, Thomas A., 3,868,921.

Matzke, William A. Textured film finished panels and method therefor. 3,869,326, Cl. 156-209.000.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Decker, Gernot; Herold, Hans; and Rohr, Horst, 3,869,301.

Mayerhoffer, Herbert; Schneider, Wilhelm; Nuring, Hardo; and Exner, Wolfgang, to Oesterreichische Hiag-Werke Aktiengesellschaft. Fuel and additive for the production thereof. 3,869,262, Cl. 44-56.000.

Mazingo, Horace R.: *See*—
Paschal, Harold L., Jr.; and Brown, Graham T., 3,869,581.

Mazzoleni, Giorgio: *See*—
Vargiu, Silvio; Giovanni, Sesto S.; Mazzoleni, Giorgio; and Pezzoli, Silvestro, 3,869,387.

McBurnett, James R.: *See*—
Ratliff, Frank W.; and McBurnett, James R., 3,868,821.

McCain, David L.: *See*—
Tarter, James H.; Read, Ronald G.; Colussi, Valentino; and McCain, David L., 3,868,964.

McClatchie, Edward A.: *See*—
Link, William T.; and McClatchie, Edward A., 3,869,613.

McConnell, Kennedy: *See*—
Coleman, Bestor P.; and McConnell, Kennedy, 3,869,031.

McCord Corporation: *See*—
Silverwood, Hartley A., 3,869,531.

McCulloch Corporation: *See*—
Gasner, William Lavier, 3,868,863.

McCurdy, Bob C. Underground electrical connector. 3,869,189, Cl. 339-96.000.

McCurdy, Wells: *See*—
Seymour, David Jackson; MacRitchie, Norman; Matthews, Parker J.; and Clark, Thomas A., 3,868,921.

McDaniel, Bobby L., to Carter, Hugh P., Jr.; and Thompson, Woodford R., Jr., part interest to each. Shooting gallery with target ball supported on a column of air. 3,869,123, Cl. 273-105.200.

McDonnell Douglas Corporation: *See*—
Tucker, James M., 3,868,883.

McGill Manufacturing Company, Inc.: *See*—
Barber, Richard H., 3,869,181.

McGreevy, Robert E.: *See*—
Snead, William K.; and McGreevy, Robert E., 3,869,542.

McGuirk, Francis A., Jr., to Wagner Electric Corporation. Power control circuit for automotive vehicles and the like. 3,869,620, Cl. 307-141.000.

McMaster, Samuel B., to Do-It Corporation. A web of double-faced pressure-sensitive stickers. 3,869,333, Cl. 161-39.000.

McMeekin, Samuel: *See*—
Mackie, John K. P.; and McMeekin, Samuel, 3,869,240.

MDT Chemical Corp.: *See*—
Schmoegner, John C.; and Burger, Norman P. (said John C. Schmoegner, a part interest assors. to), 3,869,070.

Meadows, Frank William: *See*—
Bradshaw, Arthur; and Meadows, Frank William, 3,868,902.

Mears, Adrian Leonard: *See*—
Kirton, John; Mears, Adrian Leonard; Sarginson, Richard William; and Werring, Norman John, 3,869,646.

Mebus, Charles A.; and Twiehaus, Marvin J., to Board of Regents of the University of Nebraska. Calf diarrhea virus vaccine and processes. 3,869,547, Cl. 424-89.000.

Mechoulam, Raphael; Houry, Shlomo; and Loev, Bernard, to Yissum Research Development Company; and SmithKline Corporation. 2,6-Methano-benzoxacin compounds. 3,869,475, Cl. 260-345.200.

Mecklenberg, Wolfgang: *See*—
Hoffmann, Walter; Pfeil, Hans-Dieter; and Mecklenberg, Wolfgang, 3,869,687.

Medina, Glen J.: *See*—
Field, Jesse L., Jr.; and Medina, Glen J., 3,869,107.

Medkeff, Arthur T.: *See*—
Nye, Norman H.; and Medkeff, Arthur T., 3,868,899.

Medovar, Boris Izrailevich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leonid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Perepelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich, 3,869,592.

Mendel, Eric: *See*—
Basi, Jagtar Singh; and Mendel, Eric, 3,869,324.

Menegos, Andrew J.: *See*—
Safer, Michael B.; and Menegos, Andrew J., 3,869,664.

Menju, Shinichi: *See*—
Kenmochi, Hiroshi; Menju, Shinichi; and Takahashi, Kunio, 3,869,665.

Menne, Joseph D.; and Sigulas, George N., to Caterpillar Tractor Company. Cutter head and method of forming same. 3,868,885, Cl. 90-11.00A.

Merchant, John; and Rotier, Donald J., to Honeywell, Inc. Ultrasonic control apparatus for an oculometer. 3,869,694, Cl. 340-16.00R.

Merck & Co., Inc.: *See*—
Jones, Howard, 3,869,507.
Shen, Tsung-Ying; and Jones, Howard, 3,869,506.

Merikoski, Matti Kaarlo: *See*—
Ekroos, Arne Olavi; Merikoski, Matti Kaarlo; and Levander, Bernhard Erik Oswald, 3,868,840.

Merit Abrasive Products, Inc.: *See*—
Burns, Russell W., 3,868,791.

Meroni, Giuliandrea, to Cicala Establishment. Push-button operated switch, more particularly for doors and the like. 3,869,161, Cl. 292-166.000.

Merrell, Richard L., to General Motors Corporation. Inflator for occupant restraint cushion. 3,869,143, Cl. 280-150.0AB.

Merritt Division of Murphy Pacific Marine Salvage: *See*—
Thurman, Robert K., 3,868,824.

Meschke, Robert Walter; and Watson, William Harrison, to du Pont de Nemours, E. I., and Company. Treatment of linear polyester with organic monoepoxide. 3,869,427, Cl. 260-47.0EP.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Schnabele, Werner; Knoche, Georg; and Zeyher, Fritz, 3,869,101.

Metallgesellschaft Aktiengesellschaft: *See*—
Eisenlohr, Karl-Heinz; Markwort, Helmut; and Scholz, Berthold, 3,869,377.
Scheiber, Werner, 3,869,300.

Metcalf, Eric, to Solartron Electronic Group Limited, The. Computing apparatus for tracking moving objects. 3,869,601, Cl. 235-150.200.

Metzger, Carl: *See*—
Jager, Gerhard; Metzger, Carl; Eue, Ludwig; and Schmidt, Robert, 3,869,490.

Meyer, Gundolf, to BBC Brown Boveri & Company Limited. Method of producing a composite superconductor. 3,868,768, Cl. 29-599.000.

Michel, Friedbert: *See*—
Friese, Karl-Hermann; Michel, Friedbert; Krauss, Rudolf; Jaggle, Gunther; Stumpp, Gerhard; Steiner, Josef; and Knapp, Heinrich, 3,868,939.

Michel, Jean-Claude, to Societe Industrielle de Transports Automobiles (Societe Anonyme). Refuse collecting apparatus. 3,869,050, Cl. 214-16.00R.

Michigan Chemical Corporation: *See*—
Anderson, Arnold L., 3,869,424.
Anderson, Arnold L., 3,869,425.
Anderson, Arnold L., 3,869,426.

Mick, Stanley H., to General Motors Corporation. Exhaust gas recirculation. 3,868,934, Cl. 123-119.00A.

Mick, Stanley H., to General Motors Corporation. Cold transient enrichment. 3,869,528, Cl. 261-39.00A.

Micropore Insulation Limited: *See*—
Hughes, John Thomas; and MacWilliam, Joseph Anthony, 3,869,334.

Milgo Electronic Corporation: *See*—
Ragsdale, Robert Gordon, 3,869,580.

Milkowski, Wolfgang; Zeugner, Horst; Von Eickstedt, Klaus-Wolf; and Stuhmer, Werner, to Kali-Chemie Aktiengesellschaft. N_1-(benzoyl)alkyl-N_2(phenoxy-2-hydroxypropyl and N_1-(benzoyl)alkyl-N_2-(phenylthio-2-hydroxylpropyl)piperazines. 3,869,459, Cl. 260-268.00R.

Miller, Anthony Owen: *See*—
Smee, Graham John; and Miller, Anthony Owen, 3,868,771.

Miller, Christian F., to V.C.A. Corporation. Safety closure device. 3,869,057, Cl. 215-216.000.

Miller, Donald N., to Eastman Kodak Company. Composition comprising a mixture of thermoplastic polymers for internal cleaning of extruders. 3,869,525, Cl. 260-873.000.

Miller, Edward F.; and Hellmuth, Walter W., to Texaco Inc. Ashless lubricating oil dispersant. 3,869,514, Cl. 260-584.00R.

Miller, Michael Clendenin, to Volkswagenwerk Aktiengesellschaft. Vehicle with reinforced impact-absorbing end portion. 3,869,165, Cl. 293-63.000.

Miller, Sandra R.: *See*—
Levey, John S.; Miller, Sandra R.; and Levey, Robert F., 3,869,069.

Millican, Amond B.: *See*—
Day, Leon E.; and Millican, Amond B., 3,869,178.

Milsted, Carl S.: *See*—
Paschal, Harold L., Jr.; and Brown, Graham T., 3,869,581.

Minagawa, Motonobu; and Nomura, Kuniaki, to Argus Chemical Corporation. Ortho-substituted hydroxyphenyl alkylene-carboxy-alkylene-1,3,5-triazines and antioxidant and synthetic resin compositions. 3,869,423, Cl. 260-45.8NT.

Minagawa, Teruo: *See*—
Ueda, Seiichi; and Minagawa, Teruo, 3,869,568.

Minami, Giichi: *See*—
Suzuki, Tameyuki; Yasukawa, Junichi; Ishii, Teruhiko; Minami, Giichi; Manabe, Yukihiro; and Nishimura, Mitsuo, 3,869,366.

Minner, Willy, to Licentia Patent-Verwaltungs-G.m.b.H. Electronic sequence switch with holding circuit. 3,869,623, Cl. 307-241.000.

Minnesota Mining and Manufacturing Company: *See*—
Bazille, James H., Jr., 3,869,190.

Miori, Nilo M., to Camillus Cutlery Company. Folding blade knife with blade lock. 3,868,774, Cl. 30-161.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Sawada, Yuji; Takemoto, Katsumi; and Maruoka, Yasuro, 3,869,028.

Miura, Yuji; Nagao, Taku; Sato, Masanori; Nakajima, Hiromichi; and Kawanishi, Masazumi, to Tanabe Seiyaku Co., Ltd. 3,4-Dihydroxybenzylalcohol amino derivatives. 3,869,474, Cl. 260-343.700.

Mixan, Craig E., to Dow Chemical Company, The. 4-Cyano-3,5-isothiazoledi(ylbis(thiomethylene)dithiocyanate. 3,869,466, Cl. 260-302.00S.

Miyano, Shizuo: *See*—
Kondo, Asaji; Kishimoto, Shinzo; Yazawa, Kenichiro; Miyano, Shizuo; and Honjo, Satoru, 3,869,285.

Miyano, Tetsuji: *See*—
Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, 3,869,347.

Miyata, Seiji: *See*—
Kominami, Naoya; Nakajima, Hitoshi; Miyata, Seiji; Kimura, Takeo; Chono, Masazumi; and Sakurai, Tokio, 3,869,500.

Mize, Erbie G.: *See*—
Brock, James Donald; Mize, Erbie G.; and Rylander, Henry G., 3,869,110.

Mizutani, Yasukazu: *See*—
Ubukata, Susumu; and Mizutani, Yasukazu, 3,869,588.

Mobil Oil Corporation: *See*—
Campbell, Craig C., 3,869,414.

Mocotte, Jacques; and Druet, Monique, to Progil. Certain carbonates useful for controlling mollusks and aquatic organisms. 3,869,551, Cl. 424-301.000.

Mod, Robert R.; Magne, Frank C.; Skau, Evald L.; and Sumrell, Gene, to United States of America, Agriculture. Quaternary ammonium salts of n-substituted palmitamides. 3,869,483, Cl. 260-404.500.

Mogensen, Palne: *See*—
Smars, Erik; Mogensen, Palne; and Kaij, Mats J., 3,869,616.

Mohawk Data Sciences Corporation: *See*—
Trost, Edward; and Martin, Clifford E., 3,869,698.

Momiyama, Hiroaki: *See*—
Yamagishi, Jin; and Momiyama, Hiroaki, 3,869,709.

Monark-Crescent AB: *See*—
Hagman, Gustav Rune, 3,869,245.

Monsanto Company: *See*—
Goldberg, Jack, 3,869,641.
Mathis, Thomas C.; and Morgan, Albert W., 3,869,420.
Trivette, Chester D., Jr., 3,869,435.

Montalbano, Anthony P., to Environmental Pollution Research Corporation. Portable compacting apparatus. 3,868,903, Cl. 100-45.000.

Montalvo, Joseph G., Jr., to United States of America, Health, Education and Welfare. Ammonium ion specific electrode and method therewith. 3,869,354, Cl. 204-1.00T.

Moore, Alexander Joseph, to British Insulated Callender's Cables Limited. Apparatus for extruding a covering on to a cable core. 3,869,235, Cl. 425-113.000.

Mordvinov, Vladimir Alexandrovich: *See*—
Koritsky, Andrei Vladimirovich; Ignatov, Viktor Alexandrovich; Polyak, Leonid Moiseevich; Shapiro, Semen Abramovich; Bokman, Grigory Aronovich; Mordvinov, Vladimir Alexandrovich; Zhizhin, Mikhail Ivanovich; Slonimsky, Alexandr Davydovich; Sevinian, Kimik Tigranovich; Adaskin, Semen Izrailovich; and German, Vladimir Vladimirovich, 3,869,628.

Moreau, Claude, to Societe Financiere et Industrielle des Ateliers et Chantiers de Bretagne. Machine for continuous treatment by means of liquids, more particularly for pasteurisation of substances in sachets. 3,868,897, Cl. 99-483.000.

Moreau, Rene V., to Societe Anonyme: Poclain. Bucket having a mobile back. 3,869,054, Cl. 214-146.00R.

Morgan, Albert W.: *See*—
Mathis, Thomas C.; and Morgan, Albert W., 3,869,420.

Morgan, Paul Winthrop; and Pletcher, Terry Carl, to du Pont de Nemours, E. I., and Company. Anisotropic dopes of polyamides from fumaric and/or mesaconic acid. 3,869,419, Cl. 260-30.8DR.

Moriai, Takayoshi: *See*—
Suzuki, Morio; Tachibana, Masayoshi; and Moriai, Takayoshi, 3,869,298.

Morikawa, Toshinori: *See*—
Harazono, Sinichi; and Morikawa, Toshinori, 3,869,710.

Morrison, Ian Y.; Spark, Loudon C.; and Duyf, Jelle J. Meter mounting box. 3,869,188, Cl. 339-95.00R.

Morrissey, Jack D.: *See*—
Shaffer, Paul D.; Imler, Vaughn R.; and Morrissey, Jack D., 3,869,271.

Moseman, Paul W., Jr., to Bendix Corporation, The. Method of analyzing angular motion of a pointer of an altimeter. 3,868,843, Cl. 73-1.00R.

Mosimann, Hans; Heim, Peter; and Borer, Charles, to Schweizerische Isola-Werke. Enamel composition for the manufacture of solderable enameled wires. 3,869,428, Cl. 260-77.5AQ.

Moss, Keith Graham; and Pumphrey, Nicholas William James, to Imperial Chemical Industries Limited. Electrodes and electrochemical processes. 3,869,312, Cl. 117-215.000.

Motoren-und Turbinen-Union Munchen GmbH: *See*—
Wildner, Walter, 3,869,221.

Motorola, Inc.: *See*—
Bara, Edwin S., 3,869,724.
Dattilo, Donald J., 3,869,725.
Davis, Herbert T.; and Reid, James B., 3,868,770.
Hunter, William L.; and Spanjer, Keith Gordon, 3,869,704.
Ocken, Alfred, Jr., 3,869,563.

Motter, Manfred: *See*—
Wegmuller, Hans; and Motter, Manfred, 3,869,250.

Moulinage et Ritorderie de Chavanoz: *See*—
Chatin, Remy, 3,868,812.

Mowatt-Larssen, Erling: *See*—
Becker, Peter W.; Price, Albert E.; Mowatt-Larssen, Erling; and Becker, Carl E., 3,868,913.

Mueller, Otto, Jr., to Massey-Ferguson Inc. Fulcrum bushing on the resilient bar draft sensing. 3,869,001, Cl. 172-7.000.

Muellerpoths, Reiner, to BBC Brown Boveri & Company Limited. Apparatus for monitoring the filling factor of containers for compressed gas. 3,868,963, Cl. 137-340.000.

Muenger, James R.: *See*—
Marion, Charles P.; Schlinger, Warren G.; Brent, Albert; and Muenger, James R., 3,868,817.

Mukaiyama, Teruaki; Higo, Moriaki; and Katsuyama, Harumi, to Fuji Photo Film Co., Ltd. Process for preparing spiro compounds. 3,869,480, Cl. 260-347.800.

Muller, George H., to Ford Motor Company. Resilient bumper assembly. 3,869,167, Cl. 293-71.00R.

Muller, Johann: *See*—
Hoppe, Peter; Leyer, Helmut; and Muller, Johann, 3,869,337.

Muller, Thomas P., to Caterpillar Tractor Company. Engine enclosure for hydraulic excavators. 3,869,018, Cl. 180-89.00R.

Mullier, Christian: *See*—
Sander, Pierre; and Mullier, Christian, 3,869,336.

Mullin, John P.: *See*—
Anderson, Andrew W.; and Mullin, John P., 3,869,330.

Munjat, Francis S.; and Kim, Samuel Ho, to E. F. Houghton and Company. Cationic thermosetting resin composition for improving wet strength of paper. 3,869,342, Cl. 162-164.000.

Munjat, Francis S.; and Kim, Samuel Ho, to E. F. Houghton and Company. Cationic thermosetting resin for improving wet strength of paper. 3,869,343, Cl. 162-164.000.

Munk, Miner N., to Varian Associates. Phosphor assembly for ultraviolet light absorption detector. 3,869,614, Cl. 250-365.000.

Murphy, Frank W., Jr.; Carlton, Lewis M.; and Teague, Troy L., to Frank W. Murphy Manufacturer, Inc. Tachometer instrument. 3,868,855, Cl. 73-530.000.

Murray, Ian P.: *See*—
Kaufer, Herbert; Matthews, Larry S.; Sonstegard, David A.; and Murray, Ian P., 3,868,730.

Myren, Rune L.: *See*—
Englund, Gosta R.; and Myren, Rune L., 3,869,598.

N L Industries, Inc.: *See*—
Foerster, George S., 3,869,281.

Nadeau, Georges. Apparatus for delimbing felled trees. 3,868,981, Cl. 144-2.00Z.

Nagai, Masaichi: *See*—
Ishihara, Joo; Kagohara, Hiromi; Nagai, Masaichi; and Ohuchi, Yasushi, 3,869,319.

Nagao, Taku: *See*—
Miura, Yuji; Nagao, Taku; Sato, Masanori; Nakajima, Hiromichi; and Kawanishi, Masazumi, 3,869,474.

Nakajima, Hiromichi: *See*—
Miura, Yuji; Nagao, Taku; Sato, Masanori; Nakajima, Hiromichi; and Kawanishi, Masazumi, 3,869,474.

Nakajima, Hitoshi: *See*—
Kominami, Naoya; Nakajima, Hitoshi; Miyata, Seiji; Kimura, Takeo; Chono, Masazumi; and Sakurai, Tokio, 3,869,500.

Nakao, Masaru: *See*—
Yamamoto, Hisao; and Nakao, Masaru, 3,869,472.

Nakata, Katsuhide. Ball joint. 3,869,217, Cl. 403-140.000.

Nakayama, Kaname: *See*—
Yamada, Shigeru; Hamano, Mamoru; and Nakayama, Kaname, 3,869,003.

National Equipment Corporation: *See—*
Roderick, Ronald R., 3,868,941.
National Forge Company: *See—*
Witkin, Donald E., 3,869,233.
National Research Development Corporation: *See—*
Lindsay, David Gordon; and Shall, Sydney, 3,869,437.
National Steel Corporation: *See—*
Smith, Edwin J.; and Reif, Robert B., 3,868,925.
Nederlandese Industrie voor Baggerwerktuigen Nivoba N.V.: *See—*
Holthuis, Johannes Jacobus, 3,868,751.
Nels, Jean-Paul: *See—*
Sandier, Gerard; and Nels, Jean-Paul, 3,869,607.
Nelson, Bud D.; and Brennan, William M., to United States of America, Navy. Retraction system for double pod air cushion landing gear system. 3,869,103, Cl. 244-100.00R.
Nelson, Paul E.: *See—*
Der Marderosian, Aaron C.; Nelson, Paul E.; and Stinnett, Donald F., 3,869,662.
Neschleba, Albert J.: *See—*
Mackey, E. Scudder; and Neschleba, Albert J., 3,869,402.
Nestler, Heinz: *See—*
Kotzsch, Hans-Joachim; Amort, Jurgen; Junger, Hans; Nestler, Heinz; and Weissenfels, Franz, 3,869,340.
Neuner, Otto; and Dorlars, Alfons, to Bayer Aktiengesellschaft. 7-Triazolyl-3-aryl coumarin compounds. 3,869,469, Cl. 260-308.00A.
New, George William; and Hare, Alan Lawrence, to British Titan Limited. Heating device. 3,869,593, Cl. 219-121.00P.
Newall, Christopher Earle: *See—*
Phillipps, Gordon Hanley; Newall, Christopher Earle; and Ayres, Barry Edward, 3,869,451.
Newcomb, Dean R., to Xerox Corporation. Hand tool. 3,868,983, Cl. 145-50.00R.
Newman, Douglas A.; and Brown, Albert E., to Sharkey, Melvin. Receptive copy sheets and process. 3,869,307, Cl. 117-122.0PA.
Neyer, James U., to Arens Controls, Inc. Push pull control for lawn mowers and the like. 3,868,865, Cl. 74-501.00R.
Nguyen-Tat, Thang; Pain, Roger Andre; Le Floch, Yann; and Herluison, Jean-Claude, to International Standard Electric Corporation. System for analysing telegraph characters. 3,869,570, Cl. 178-26.00R.
Nico Magnetics Inc.: *See—*
Long, Kenneth E.; and Taylor, David W., 3,869,356.
Niimi, Itaru: *See—*
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 3,869,410.
Nikitin, Jury Stepanovich: *See—*
Bebris, Natalya Karlovna; Kiselev, Andrei Vladimirovich; Nikitin, Jury Stepanovich; and Yashin, Yakov Ivanovich, 3,869,409.
Niles, Earl Thomas; Seaman, Beverly A. H.; and Wilson, Edwin J., to Dow Chemical Company, The. Stabilization of aluminum hydride. 3,869,544, Cl. 423-645.000.
Nilsson, Jan, to Almanna Svenska Elektriska Aktiebolaget. Method of joining wire or rods of compound material with aluminum core and copper casing. 3,868,762, Cl. 29-470.100.
Nippon Electric Company, Limited: *See—*
Sato, Akio; and Sato, Shigehiko, 3,869,367.
Shimizu, Kyozo, 3,869,622.
Yano, Akira; Sato, Norio; and Iwakawa, Tunekiyo, 3,869,644.
Yoshimura, Shoichiro, 3,869,117.
Nishimura, Mitsuo: *See—*
Suzuki, Tameyuki; Yasukawa, Junichi; Ishii, Teruhiko; Minami, Giiichi; Manabe, Yukihiro; and Nishimura, Mitsuo, 3,869,366.
Nissan Motor Company Limited: *See—*
Ishikawa, Yoshikazu, 3,868,929.
Ito, Naganori; and Aikawa, Hiroshi, 3,869,141.
Itoh, Takane, 3,868,818.
Kakizaki, Tadao, 3,868,743.
Kishimoto, Kyuji; Tojima, Toshiaki; and Ishii, Hideto, 3,868,928.
Nissen Corporation: *See—*
Nissen, George P., 3,869,120.
Nissen, George P., to Nissen Corporation. Protective end covers for the resilient suspension members of trampoline beds and the like. 3,869,120, Cl. 272-65.000.
NL Industries, Inc.: *See—*
Yankee, Herbert L.; and Correte, Richard H., 3,868,871.
Nobel, Fred I.; and Ostrow, Barnet D., to Lea-Ronal, Inc. Electrolytes for the electrolytic deposition of zinc. 3,869,358, Cl. 204-55.00Y.
Noda, Fumiyoshi: *See—*
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 3,869,410.
Noddings, John: *See—*
Hunt, Norman; and Noddings, John, 3,868,869.
Noe, Gerald H.; and Woodfill, William L., to Brunswick Corporation. Shaft coupling apparatus particularly for marine inboard-outboard propulsion systems. 3,868,833, Cl. 64-27.0NM.
Noiles, Douglas G.; and Spasiano, Anthony D., to United States Surgical Corporation. Drop former for intravenous set. 3,868,965, Cl. 137-559.000.
Nolan, Gaillard R., to Instrumentation Laboratory, Inc. Sample cell assembly having a heat conductive chamber surrounded by an electrothermal heating layer. 3,869,215, Cl. 356-246.000.
Nolte, Karl-Heinz: *See—*
Knappe, Heinrich; Nolte, Karl-Heinz; and Kempelmann, Reinhold, 3,869,073.
Nomura, Kuniaki: *See—*
Minagawa, Motonobu; and Nomura, Kuniaki, 3,869,423.
Nordstrom, Erik Gustav Wendel. Apparatus for manufacturing perforated tubes. 3,868,876, Cl. 82-20.000.
Norsk Hydro A.S.: *See—*
Fonne, Gunnar Johan; and Jahnsen, Thor Helge, 3,869,309.
Norstar Ski Corporation Ltd.: *See—*
Caporicci, Domenico, 3,868,783.
Norton Company: *See—*
Corcoran, John J.; and Kalinowski, Paul W., 3,868,793.
Nottingham, Robert B.: *See—*
Gaussoin, Julius; Nottingham, Robert B.; and Reichard, Robert E., 3,869,617.
Noveroske, Robert L., to Dow Chemical Company, The. Compositions and method for altering plant growth with an alkylenebisdithiocarbamatic complex. 3,869,273, Cl. 71-77.000.
Noyes, Billy P.; and Willard, Howard L., to Formo, Alvin C. Bagging process. 3,868,807, Cl. 53-29.000.
Nupuf, Joseph S. Ophthalmometer device. 3,869,206, Cl. 356-2.000.
Nuring, Hardo: *See—*
Mayerhoffer, Herbert; Schneider, Wilhelm; Nuring, Hardo; and Exner, Wolfgang, 3,869,262.
Nye, Norman H.; and Medkeff, Arthur T. Balloon printing apparatus. 3,868,899, Cl. 101-35.000.
O'Brien, John Leslie; Finnimore, Bryan; and Hogg, Dallas John Arthur. Joints. 3,869,156, Cl. 285-374.000.
Oce-van der Grinten, N.V.: *See—*
Peters, Martinus T. J., 3,869,292.
Ocken, Alfred, Jr., to Motorola, Inc. Encapsulation housing for electronic circuit boards or the like and method of encapsulating. 3,869,563, Cl. 174-52.0PE.
O'Connor, Edward W.: *See—*
United States of America, National Aeronautics and Space Administration; Trusch, Raymond B.; and O'Connor, Edward W., 3,868,830.
Odier, Marc. Game with arcuate pieces. 3,869,125, Cl. 273-137.00D.
Oesterreichische Hiag-Werke Aktiengesellschaft: *See—*
Mayerhoffer, Herbert; Schneider, Wilhelm; Nuring, Hardo; and Exner, Wolfgang, 3,869,262.
Ogawa, Takashi; Kida, Kiyonori; and Sugiyama, Shunichi, to Fuji Denki Seizo Kabushiki Kaisha. Stator in small electric machine. 3,869,629, Cl. 310-216.000.
Ogilvie Flour Mills Company, Limited, The: *See—*
Hampton, Richard John; Shantz, John T.; Gallo, Thomas; and Unger, Peter, 3,869,558.
Oglesbee, Richard K., to Anchor Hocking Corporation. Carton lock. 3,869,079, Cl. 229-40.000.
Ohashi, Reiji. Driving mat for practicing golf shots. 3,869,128, Cl. 273-195.00A.
Ohira, Tsunehisa; and Takahashi, Tohru, to Victor Company of Japan Ltd. Dictator-transcriber indexing system. 3,869,720, Cl. 360-72.000.
Ohlson, Kurt Lennart. Shelf construction. 3,868,916, Cl. 108-103.000.
Ohuchi, Yasushi: *See—*
Ishihara, Joo; Kagohara, Hiromi; Nagai, Masaichi; and Ohuchi, Yasushi, 3,869,319.
Oil States Rubber Company: *See—*
Landers, Don B., 3,868,826.
Oilgear Company, The: *See—*
Bobier, Wilfred S., 3,868,889.
Okagaki, Hiroshi, to Hitachi, Ltd. Apparatus for emitting atomic flourescence spectral lines used for atomic absorption analysis. 3,869,643, Cl. 315-167.000.
Olashaw, William F., to General Electric Company. Insulative torque coupling assembly for electrical device terminals. 3,868,874, Cl. 81-121.00R.
Olde, Jarl Rune. Automatic water dispenser. 3,868,926, Cl. 119-75.000.
Oliver, Clifford C.: *See—*
Gates, John I., 3,868,789.
Oliver, James L., to Eaton Corporation. Self-adjusting brake mechanism. 3,869,025, Cl. 188-79.5GE.
Olsen, Ralph A., to Ford Motor Company. Pattern alignment means for use with lost foam molding process. 3,868,986, Cl. 164-7.000.
Olsson, David Lawrence; and Singerman, Sol, to American Cyanamid Company. Reel-label for small diameter sutures. 3,869,044, Cl. 206-63.300.
Olsson, Tore Bertil Reinhold, to Aktiebolaget Bofors. Picture generating unit of scanning type. 3,869,565, Cl. 178-6.800.
O'Neill, Robert W.: *See—*
United States of America, National Aeronautics and Space Administration; and O'Neill, Robert W., 3,869,624.
Onishi, Kazutoshi: *See—* .
Masuzawa, Isao; Onishi, Kazutoshi; and Awano, Tsuneo, 3,869,653.
Ono, Hiroshi; and Yoshida, Mitsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Gasket structure. 3,869,375, Cl. 204-301.000.
Orlov, Vladimir Alexandrovich; Zaitseva, Vera Dmitrievna; Sinitsyn, Viktor Alexeevich; and Rostovtseva, Ekaterina Efimovna. Method of surface modification of polymer materials. 3,869,303, Cl. 117-47.00A.
Osbond, John Mervyn; and Wickens, James Charles, to Hoffmann-La Roche Inc. Chrysanthemic acid esters and their use as insecticides. 3,869,552, Cl. 424-306.000.
Osmundson, John: *See—*
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Ostrow, Barnet D.: *See—*
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Ota, Mitsuru: *See—*
Yoshikawa, Shinsuke; Sasaki, Tohru; Ota, Mitsuru; Terasaki, Shuji; and Funakoshi, Akira, 3,869,534.

Otake, Yukio: *See—*
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Otto, Rigobert: *See—*
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Ousterling, David L.: *See—*
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Ovitron Research Corporation: *See—*
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Owens-Corning Fiberglas Corporation: *See—*
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Owens-Illinois, Inc.: *See—*
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Owens, James C.; and Blazey, Richard N., to Eastman Kodak Company. Light-deflecting system for effecting bragg diffraction over a wide bandwidth. 3,869,197, Cl. 350-161.000.

Owens, Robert C., Jr., to VAS Ltd. Single field video recording system and method. 3,869,713, Cl. 360-35.000.

Oxley, Louise V. Playground amusement device. 3,869,119, Cl. 272-38.000.

Oy Nobia AB: *See—*
Ekroos, Arne Olavi; Merikoski, Matti Kaarlo; and Levander, Bernhard Erik Oswald, 3,868,840.

Pagdin, Brian Colin; and Webb, Oswald, to GKN Transmissions Limited. Four-wheel-drive vehicles. 3,869,013, Cl. 180-44.00R.

Pain, Roger Andre: *See—*
Nguyen-Tat, Thang; Pain, Roger Andre; Le Floch, Yann; and Herluison, Jean-Claude, 3,869,570.

Palmer, Derek Reginald, to Beecham Group Limited. DL-2-(4-hydroxyphenyl)-glycine-N,O-diacetate and salts. 3,869,505, Cl. 260-479.00R.

Papa, Anthony Joseph; and Proops, William Robert, to Union Carbide Corporation. Cycloaliphatic ester polyols. 3,869,502, Cl. 260-468.00J.

Paris, Carmen J.: *See—*
Stahl, Oliver B.; and Paris, Carmen J., 3,868,731.

Parish, Frank T., to Pressure Chemical Corporation. Machines and methods for the manufacture of containers and the product therefrom. 3,868,891, Cl. 93-8.00W.

Parke, Davis & Company: *See—*
Graetz, Ernest F. J., 3,868,948.

Parsons, Samuel J.: *See—*
Bowles, Andrew D.; and Parsons, Samuel J., 3,869,295.

Pascale, John V.: *See—*
Pittet, Alan O.; Pascale, John V.; and Hruza, Denis E., 3,869,554.

Paschal, Harold L., Jr.; and Brown, Graham T., to Mazingo, Horace R.; Warlick, Alex, Jr.; and Milsted, Carl S., part interest to each. Telephone allotter circuit for equalizing circuit usage. 3,869,581, Cl. 179-18.00H.

Paschall, James W. Welding hood. 3,868,727, Cl. 2-8.000.

Passmore, Edmund M.: *See—*
Anderson, Warren A.; Passmore, Edmund M.; and Matheson, Wilfrid G., 3,869,631.

Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leonid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Perepelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich. Method of electroslag welding or hardfacing. 3,869,592, Cl. 219-73.000.

Patton, Richard S.: *See—*
Allen, John E.; Hanley, John F., Jr.; Armdur, Frank K.; Krikau, Frederick G.; and Patton, Richard S., 3,869,352.

Patz, Roman J.; Sell, Frank O.; and Halbeck, Werner B., to Cutter-Hammer, Inc. Miniature wrist watch switch. 3,869,586, Cl. 200-11.00G.

Patz, Ulrich F. M.; Sommerkamp, Peter; and Josephy, Julius. Heating arrangement with focused electron beams under vacuum. 3,869,675, Cl. 328-228.000.

Paul, James R.: *See—*
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Pauwels, Edward M.: *See—*
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Pawlowski, Edward W.: *See—*
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Payne, Calvin L., Jr.; and Gambello, Vincent J., to Tudor Games, Incorporated. Football game. 3,869,122, Cl. 273-94.00R.

Payne, Harry R., to Cavalier Corporation. Mechanical sold out for rotary slant shelf. 3,869,064, Cl. 221-19.000.

Peak, Ben H. Cutting device. 3,868,878, Cl. 83-356.300.

Pearson, Robert M.: *See—*
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Pease, Robert A.: *See—*
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Peel, Richard E.; and Saethre, Arild O., to Ford Motor Company. Webbing slot for seat belt retractor housing. 3,869,097, Cl. 242-107.000.

Pelabon, Andre E. Gas turbine railway car. 3,868,908, Cl. 105-1.00R.

Pelabon, Andre E. Railway train control line adaptor plug. 3,868,909, Cl. 105-1.00R.

Peltier, Henri; Chatourel, Pierre; and Bailly, Roger, to Regie Nationale des Usines Renault. Transfer apparatus. 3,869,055, Cl. 214-151.000.

Peltier, Jean Paul, to Thomson - CSF. System for converting television signals into angle modulated carrier waveforms of reduced bandwidth and vice-versa. 3,869,706, Cl. 358-12.000.

Pennsylvania Engineering Corporation: *See—*
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Penwalt Corporation: *See—*
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Pera, John D.: *See—*
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Periard, John Neil, to Dow Chemical Company, The. Method of preparing a calcium carbonate-magnesium hydroxide pigment. 3,869,299, Cl. 106-306.000.

Perklev, Torsten: *See—*
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 3,869,527.

Perrin, Georges: *See—*
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Pervukhin, Leonid Borisovich: *See—*
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Pesaro, Mario: *See—*
Bozzato, Giuliano; and Pesaro, Mario, 3,869,493.

Pesendorfer, Alfred, to Brown Boveri Selzer Turbomaschinen AG. Flexible sealing device. 3,869,133, Cl. 277-27.000.

Peters, Charles W.; and Ebert, Larry K., to Trus Joist Corporation. I beam nesting and stacking method and apparatus. 3,869,036, Cl. 198-35.000.

Peters, Martinus T. J., to Oce-van der Grinten, N.V. Light-sensitive compositions and light-sensitive materials such as printing plates. 3,869,292, Cl. 96-115.00R.

Peterson, David A., to Iowa State University Research Foundation Inc. Panel jack connector. 3,868,800, Cl. 52-285.000.

Peterson, William R.; and Johnson, Walter N., to GAF Corporation. Carboxylated graft copolymer and emulsion containing same. 3,869,418, Cl. 260-29.70T.

Petree, Marcella C.: *See—*
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Petrek, John Paul, to United States of America, Atomic Energy Commission. Liquid metal operated heat exchanger. 3,868,994, Cl. 165-142.000.

Pezzoli, Silvestro: *See—*
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Pfeil, Hans-Dieter: *See—*
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Pfizer Inc.: *See—*
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Philippaerts, Herman Adelbert; Pollet, Robert Joseph; Vandenberghe, Antoon Leon; and Willems, Jozef Frans, to Agfa-Gevaert N.V. Photographic silver halide elements of the Lippmann-type. 3,869,290, Cl. 96-76.00R.

Phillipps, Gordon Hanley; Newall, Christopher Earle; and Ayres, Barry Edward, to Glaxo Laboratories Limited. Anaesthetic steroids of the pregnane and 19-norpregnane series. 3,869,451, Cl. 260-239.500.

Phillips Petroleum Company: *See—*
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Campbell, Robert W., 3,869,433.
Campbell, Robert W.; and Scoggins, Lacey E., 3,869,434.
Ramsay, Ray D., 3,869,417.
Zuech, Ernest A., 3,869,470.

Piber, Earl T., to Cutler-Hammer, Inc. Trigger switch with latch and vernier speed adjusting shaft. 3,869,591, Cl. 200-321.000.

Pierce Chemical Company: *See—*
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Pioneer Electronic Corporation: *See—*
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Igata, Toyonori, 3,869,130.
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Piper, Robert J.; and Locke, Frank K., to Stearns Manufacturing Co. Inc. Article conveying apparatus. 3,869,038, Cl. 198-165.000.
Piskala, Alois, to Ceskoslovenska akademie ved. Process of preparing 6-azapyrimidine ribonucleosides. 3,869,446, Cl. 260-211.5OR.
Pitney-Bowes, Inc.: *See*—
Sansone, Ronald P., 3,869,599.
Pitney, Lennord L.: *See*—
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Pittet, Alan O.; Pascale, John V.; and Hruza, Denis E., to International Flavors & Fragrances Inc. Process for altering the flavoring properties of foodstuffs. 3,869,554, Cl. 426-65.000.
Pittman, Allen G.: *See*—
Stanley, William L.; and Pittman, Allen G., 3,869,385.
Pittroff, Hans, to SKF Industrial Trading and Development Company. Packing seals. 3,869,134, Cl. 277-56.000.
Pletcher, Terry Carl: *See*—
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Podolan, Edward G., to General Motors Corporation. Vehicle window stabilizing mechanism. 3,868,788, Cl. 49-374.000.
Pogers, Richard J., to Marathon Oil Company. Process for preparing and using aqueous polyacrylamide solutions for the secondary recovery of oil. 3,868,997, Cl. 166-275.000.
Polaroid Corporation: *See*—
Chiang, Yunn H.; and Sparks, John W., 3,869,473.
Pollet, Robert Joseph: *See*—
Philippaerts, Herman Adelbert; Pollet, Robert Joseph; Vandenberghe, Antoon Leon; and Willems, Jozef Frans, 3,869,290.
Pollock, Andre W.; and Durrett, James M., to Sun Oil Company of Pennsylvania. Combination cracking process. 3,869,378, Cl. 208-78.000.
Polva-Nederland B.V.: *See*—
Bos, Fredericus Antonius Jozef, 3,868,810.
Polyak, Leonid Moiseevich: *See*—
Koritsky, Andrei Vladimirovich; Ignatov, Viktor Alexandrovich; Polyak, Leonid Moiseevich; Shapiro, Semen Abramovich; Bokman, Grigory Aronovich; Mordvinov, Vladimir Alexandrovich; Zhizhin, Mikhail Ivanovich; Slonimsky, Alexandr Davydovich; Sevinian, Kimik Tigranovich; Adaskin, Semen Izrailovich; and German, Vladimir Vladimirovich, 3,869,628.
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Pressure Science, Inc.: *See*—
Taylor, Dudley D.; Sadoff, Bernard J., Jr.; and Halling, Horace P., 3,869,132.
Preston, Henry Richard. Applicaton of container closures. 3,868,808, Cl. 53-97.000.
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Princeton Electro Dynamics, Inc.: *See*—
Long, Donald Charles; Hartsough, Albert Charles; and Sanford, Robert Fincher, 3,869,651.
Priola, Michael A.; and Carver, Ernest C., to Ciba-Geigy Corporation. Novel industrial weed control compositions. 3,869,276, Cl. 71-93.000.
Prochnow, Claus, to Rollei-Werke Franke & Heidecke. Electronic flash apparatus. 3,869,604, Cl. 240-1.300.
Procter & Gamble Company, The: *See*—
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Produits Chimiques Ugine Kuhlman: *See*—
Weiss, Francis; Schirmann, Jean-Pierre; and Mathais, Henri, 3,869,541.
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Province, William F., to Emerson Electric Company. Bead removal tool. 3,868,773, Cl. 30-130.000.
Pruess, David: *See*—
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Przybylinski, Philip G. High side sill railroad car. 3,868,914, Cl. 105-248.000.
Pulido, Miguel L.: *See*—
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Puschel, Walter: *See*—
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Puttock, Michael Charles; and Linfoot, Bryan Crosby, to EMI Limited. Dynamo electric machines. 3,869,626, Cl. 310-152.000.
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Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leonid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Perepelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich, 3,869,592.
Quality Pool Supply Co.: *See*—
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Quimby, Charles A. Wheelock for vehicle wheels. 3,868,837, Cl. 70-259.000.
Quiogue, Virgilio J.: *See*—
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Rabone Chesterman Limited: *See*—
Hogan, Brian David; and Poole, Dennis Frederick, 3,869,096.
Racca, Terenzio. Cannelon and stuffed spaghetti molding apparatus. 3,869,238, Cl. 425-294.000.
Radamaker, George L., to Eaton Corporation. Vehicle spring assembly and method of clamping same. 3,869,142, Cl. 280-124.00R.
Ragailler, Franz, to Armaturen-Gesellschaft m.b.H. Springmine. 3,868,905, Cl. 102-8.000.
Ragsdale, Robert Gordon, to Milgo Electronic Corporation. Apparatus for testing data modems which simultaneously transmit and receive frequency multiplexed signals. 3,869,580, Cl. 179-15.0BF.
Rahnke, Christian J.; and Vallance, James K., to Ford Motor Company. Seal means for a gas turbine engine. 3,869,222, Cl. 415-134.000.
Rakowitz, David Henry: *See*—
Johnson, Robert Bird; Rakowitz, David Henry; Barber, William Austin; and Fetchin, John Allan, 3,869,511.
Ramanathan, Visvanathan, to Ciba-Geigy AG. Water-insoluble styryl dyestuffs. 3,869,498, Cl. 260-465.00D.
Ramby, Inc.: *See*—
Jensen, Howard, 3,869,011.
Ramsay, Ray D., to Phillips Petroleum Company. Modification of asphalt with ethylene-vinyl acetate copolymers to improve properties. 3,869,417, Cl. 260-28.5AS.
Rannenberg, George C., to United Aircraft Corporation. Self-cleaning coalescer. 3,869,266, Cl. 55-309.000.
Rarick, Raymond E., to Inno-vet Instruments, Inc. Calf extraction mechanism. 3,868,958, Cl. 128-352.000.

Ratliff, Frank W.; and McBurnett, James R., to Tyrone Hydraulics, Inc. Automatic pump control system. 3,868,821, Cl. 60-421.000.

Rau, Eric: *See—*
Sproul, Jared Sanford; and Rau, Eric, 3,869,538.

Rayner, Francis: *See—*
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Raytheon Company: *See—*
Der Marderosian, Aaron C.; Nelson, Paul E.; and Stinnett, Donald F., 3,869,662.

RCA Corporation: *See—*
Belohoubek, Erwin Franz; and Presser, Adolph, 3,869,677.
Korda, Peter Bela, 3,869,721.
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Woywood, Dennis Joseph; and Corsover, Stephen Leonard, 3,869,705.

Read, Ronald G.: *See—*
Tarter, James H.; Read, Ronald G.; Colussi, Valentino; and McCain, David L., 3,868,964.

Rees, J. Samuel. Apparatus for continuously sharpening a rotary blade. 3,868,795, Cl. 51-248.000.

Regie Nationale des Usines Renault: *See—*
Dera, Alain; and Besseau, Daniel, 3,869,163.
Peltier, Henri; Chatourel, Pierre; and Bailly, Roger, 3,869,055.
Rivere, Jean-Pierre, 3,868,936.

Rehfeld, Frederick L. J., to General Motors Corporation. Vehicle steering gear assembly. 3,868,888, Cl. 91-375.00A.

Reichard, Robert E.: *See—*
Gaussoin, Julius; Nottingham, Robert B.; and Reichard, Robert E., 3,869,617.

Reichardt, Wolfgang; Blanchard, Lucien; and Denamps, Jean, to Robert Bosch G.m.b.H. Starter for internal combustion engines. 3,868,858, Cl. 74-7.00R.

Reid, James B.: *See—*
Davis, Herbert T.; and Reid, James B., 3,868,770.

Reif, Robert B.: *See—*
Smith, Edwin J.; and Reif, Robert B., 3,868,925.

Reliance Electric Company: *See—*
Williams, Roger B., Jr.; Loshbough, Richard C.; and Pryor, Edward G., 3,869,005.

Rembault, Michel: *See—*
Spitz, Erich; and Rembault, Michel, 3,869,575.

Retention Communication Systems, Inc.: *See—*
Blethen, William M., 3,869,716.

Reuschel, Konrad; Keller, Wolfgang; Kersting, Arno; and Emeis, Reimer, to Siemens Aktiengesellschaft. Apparatus for indiffusing dopants into semiconductor material. 3,868,924, Cl. 118-49.000.

Rexroad, James O.: *See—*
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Reynolds Metals Company: *See—*
Arfert, Horst F. W., 3,868,917.

Rhodia, Inc.: *See—*
Gradeff, Peter S.; and Bertrand, Claude, 3,869,517.

Ricca, John S.; and Stedman, Robert N., to Caterpillar Tractor Company. Bracket and bolt-retaining means for tractor roller assemblies. 3,869,179, Cl. 308-34.000.

Rice, Daniel L., to General Motors Corporation. Conveyor for cylindrical parts. 3,869,040, Cl. 198-219.000.

Richards, George W., to Combustion Engineering, Inc. Vapor recovery method and system. 3,869,264, Cl. 55-88.000.

Richardson-Merrell Inc.: *See—*
Andrews, Edwin R.; Claxton, George P.; Roberts, Edward McC.; and Fleming, Robert W., 3,869,496.

Richter, Sidney B.; and Levine, Alfred A., to Velsicol Chemical Corporation. Alpha-thiocyanoacetamides. 3,869,471, Cl. 260-326.11R.

Ricoh Co., Ltd.: *See—*
Tabata, Yasuhiro; and Ukai, Takeshi, 3,869,202.

Rippon, John Roy: *See—*
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Risley, Hugh A.: *See—*
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Rivere, Jean-Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Fuel injection systems. 3,868,936, Cl. 123-139.0AW.

Rivers, Roy Wilben: *See—*
Mason, Peter John; Hutchinson, Gary Lee; Lavery, Lawrence Phillip; Punt, Vernon Edmund; and Rivers, Roy Wilben, 3,869,569.

Roach, Raymond F. Shotgun-rifle holder. 3,869,074, Cl. 224-1.00R.

Robbins, G. Howard: *See—*
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Robert Bosch G.m.b.H.: *See—*
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Roberts, Edward McC.: *See—*
Andrews, Edwin R.; Claxton, George P.; Roberts, Edward McC.; and Fleming, Robert W., 3,869,496.

Roberts, Hess M. Container with integral pump. 3,869,071, Cl. 222-385.000.

Roberts, James K.; and Pauwels, Edward M., to Bendix Corporation, The. Seal for hydraulic pressure modulator. 3,868,890, Cl. 92-86.000.

Roberts, John A.; and Roberts, Peter R., to Brunswick Corporation. Passage structure. 3,868,792, Cl. 51-204.000.

Roberts, Peter R.: *See—*
Roberts, John A.; and Roberts, Peter R., 3,868,792.

Rockland, Louis B.; Zaragosa, Eufrocina M.; and Hahn, Dulcie M., to United States of America, Agriculture. Process for preparing quick-cooking garbanzo and red kidney beans. 3,869,556, Cl. 426-352.000.

Rockwell International Corporation: *See—*
Flamand, Maurice R., 3,868,977.

Roderick, Ronald R., to National Equipment Corporation. Heat-holding apparatus. 3,868,941, Cl. 126-19.00R.

Rohr, Horst: *See—*
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Rohr Industries Inc.: *See—*
Schubach, Theodor C., 3,868,802.
Schubach, Theodor C., 3,869,012.
Tantlinger, Keith W., 3,868,804.

Rokitansky, Karl, to Vogelsbusch Gesellschaft m.b.H. Process and apparatus for filtering suspensions. 3,869,389, Cl. 210-77.000.

Roll, Louis C.: *See—*
Keene, Derek K.; and Roll, Louis C., 3,869,047.

Roll, Walter, to Daimler-Benz Aktiengesellschaft. Valve seat ring for the fastening in cylinder heads of internal combustion engines. 3,868,953, Cl. 123-188.00S.

Rollei-Werke Frahke & Heidecke: *See—*
Sabanci, Mehmet, 3,869,642.

Rollei-Werke Franke & Heidecke: *See—*
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Roof, Lewis B.: *See—*
Ayers, Buell O.; and Roof, Lewis B., 3,868,970.

Rosan Enterprises: *See—*
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Rose, Richard S.; and Clark, Burton P., to General Electric Company. Article handling system. 3,868,884, Cl. 89-11.000.

Rosecon, Inc.: *See—*
Shirrell, Clarence Lee, 3,869,532.

Ross, Mary C. Top-fitted bed sheet. 3,868,735, Cl. 5-334.00C.

Rostovtseva, Ekaterina Efimovna: *See—*
Orlov, Vladimir Alexandrovich; Zaitseva, Vera Dmitrievna; Sinitsyn, Viktor Alexeevich; and Rostovtseva, Ekaterina Efimovna, 3,869,303.

Rotier, Donald J.: *See—*
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Roussel, Jacques; and Perrin, Georges, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude. Comminuting apparatus and method. 3,869,090, Cl. 241-5.000.

Rowe, Colin Michael; and Rayner, Francis, to U.S. Philips Corporation. Semiconductor device having an improved supply lead support. 3,869,703, Cl. 357-79.000.

Rowe, H. Edward: *See—*
United States of America, National Aeronautics and Space Administration; Osmundson, John; Rowe, H. Edward; and Santarpia, Dominick, 3,869,680.

Rozanov, Dmitry Pavlovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leonid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Perepelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich, 3,869,592.

Rucinski, David W.: *See—*
Liebman, Bernard; and Rucinski, David W., 3,868,935.

Russell, John L., Jr.; and DePlomb, Eugene P., to Gulf Oil Corporation. Concentrator, method, and system for utilizing radiant energy. 3,868,823, Cl. 60-641.000.

Russo, Dominic, to Russo Ornamental Iron Products, Inc. Railing construction. 3,869,109, Cl. 256-59.000.

Russo Ornamental Iron Products, Inc.: *See—*
Russo, Dominic, 3,869,109.

Ruus, Waldemar; and Stephan, Herbert, to Leybold-Heraeus Verwaltung GmbH. Apparatus for preparing pellets by means of beams of charged particles. 3,869,232, Cl. 425-6.000.

Rylander, Henry G.: *See—*
Brock, James Donald; Mize, Erbie G.; and Rylander, Henry G., 3,869,110.

Rymarchyk, Nicholas M.: *See—*
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Ryuichi Mujamoto: *See—*
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S & S Product Engineering Service, Inc.: *See—*
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Sabanci, Mehmet, to Rollei-Werke Frahke & Heidecke. Control circuit for electronic flash apparatus. 3,869,642, Cl. 315-151.000.

Sabol, Joseph J., to Garcia Corporation. Fishing lure. 3,868,784, Cl. 43-42.230.

Sadoff, Bernard J., Jr.: *See—*
Taylor, Dudley D.; Sadoff, Bernard J., Jr.; and Halling, Horace P., 3,869,132.

Saeki, Keiso: *See*—
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Saethre, Arild O.: *See*—
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Safer, Michael B.; and Menegos, Andrew J., to Avtron Manufacturing, Inc. Improved surge tester for electrical windings. 3,869,664, Cl. 324-51.000.
Safeway Products Inc.: *See*—
Howie, John R., 3,869,596.
Sailer, Heinz: *See*—
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Saji, Yasuo; and Ikegami, Shigeru, to Toho Beslon Co., Ltd. Composite acrylic fibers and spun yarns. 3,868,816, Cl. 57-140.0BY.
Sakai, Tadao; Yamamoto, Nobuo; Yoneyama, Masakazu; Sawahara, Masao; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Color photographic materials. 3,869,287, Cl. 96-22.000.
Sakurai, Tokio: *See*—
Kominami, Naoya; Nakajima, Hitoshi; Miyata, Seiji; Kimura, Takeo; Chono, Masazumi; and Sakurai, Tokio, 3,869,500.
Salem Corporation: *See*—
Wilt, Charles R., Jr.; and Schauermann, Floyd L., 3,868,779.
Saltz, Julian; and Wasilewski, Joseph C. Maximum slope detectors. 3,869,666, Cl. 324-76.00R.
Sanchez, Rodolfo Leuze. Bell-shaped pipe coupling having connections for household service and the like. 3,869,154, Cl. 285-156.000.
Sander, Pierre; and Mullier, Christian, to Trentesaux-Toulemonde S.A. Transfer sheets for transfer printing. 3,869,336, Cl. 161-146.000.
Sandier, Gerard; and Nels, Jean-Paul, to Schlumberger Technology Corporation. Radioactive means for measuring distance intervals between anomalies in an earth formation. 3,869,607, Cl. 250-266.000.
Sandoz-Wander, Inc.: *See*—
Kathawala, Faizulla G., 3,869,450.
Sanford, Arthur Carol. Rolling truss joint connector plates. 3,868,898, Cl. 100-35.000.
Sanford, Robert Fincher: *See*—
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Sangenis, Solange: *See*—
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Sanjean, John: *See*—
Cahoy, Roger P.; and Sanjean, John, 3,869,497.
Sansone, Ronald P., to Pitney-Bowes, Inc. Optical pen for hand scanning digitally encoded records. 3,869,599, Cl. 235-61.11E.
Santarpia, Dominick: *See*—
United States of America, National Aeronautics and Space Administration; Osmundson, John; Rowe, H. Edward; and Santarpia, Dominick, 3,869,680.
Sanwa Kizai Kabushiki Kaisha: *See*—
Yamada, Shigeru; Hamano, Mamoru; and Nakayama, Kaname, 3,869,003.
Sapp, George G.; and Goodrich, Joseph L., to Chevron Research Company. Resilient oil-extended polyurethane surfaces. 3,869,421, Cl. 260-33.6AQ.
Sarginson, Richard William: *See*—
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Sartorius-Membranfilter GmbH: *See*—
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Sasaki, Tohru: *See*—
Yoshikawa, Shinsuke; Sasaki, Tohru; Ota, Mitsuru; Terasaki, Shuji; and Funakoshi, Akira, 3,869,534.
Saso, Vittorio. Device for withdrawing labels from a store in labelling machines. 3,869,331, Cl. 156-571.000.
Sato, Akio; and Sato, Shigehiko, to Nippon Electric Company, Limited. Process for manufacturing a conductive film for a thin film integrated circuit device. 3,869,367, Cl. 204-192.000.
Sato, Chosei; Yamada, Yasutoku; and Takenaka, Yoshiyuki, to Showa Denko Kabushiki Kaisha. Method and device for waste heat recovery and sand removal in the bayer process. 3,869,537, Cl. 423-121.000.
Sato, Masami: *See*—
Fukushima, Osamu; Kogame, Kunio; and Sato, Masami, 3,869,310.
Sato, Masanori: *See*—
Miura, Yuji; Nagao, Taku; Sato, Masanori; Nakajima, Hiromichi; and Kawanishi, Masazumi, 3,869,474.
Sato, Mitsuharu, to Toshiba Kikai Kabushiki Kaisha. Automatic tool exchanging apparatus. 3,868,763, Cl. 29-568.000.
Sato, Norio: *See*—
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Sato, Shigehiko: *See*—
Sato, Akio; and Sato, Shigehiko, 3,869,367.
Satter, Abdus: *See*—
Christopher, Charles A., Jr.; and Satter, Abdus, 3,868,999.
Saucier, Rene: *See*—
Vezina, Claude; Saucier, Rene; and Sehgal, Surendra N., 3,869,346.
Sawada, Yuji; Takemoto, Katsumi; and Maruoka, Yasuro, to Mitsubishi Jukogyo Kabushiki Kaisha. Dolly using a warm-kept battery as its driving power source. 3,869,028, Cl. 191-1.00R.
Sawahara, Masao: *See*—
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Sawers, James R.: *See*—
Ellis, George S.; Kimble, Thomas E.; and Sawers, James R., 3,868,750.
Sawyer, Bruce A. Plural axis linear position. 3,869,625, Cl. 310-12.000.
Sayles, Donald A. Method and apparatus for continuously sensing the condition of a gas stream. 3,869,370, Cl. 204-195.00S.
Scandia Packaging Machinery Company: *See*—
Anderson, Andrew W.; and Mullin, John P., 3,869,330.
Scannell, James Parnell: *See*—
Berger, Julius; Pruess, David; and Scannell, James Parnell, 3,869,277.
Scerbo, Louis Joseph, to Bell Telephone Laboratories, Incorporated. Positive drive vibratory mechanism. 3,868,859, Cl. 74-61.000.
Schach, Albert: *See*—
Buttel, Helmut; Isert, Ingo Rudiger; Leicht, Alfred; and Schach, Albert, 3,869,685.
Schacher, Hans-Dieter; Fischer, Reinhold; and Kunst, Matthias, to Daimler-Benz Aktiengesellschaft. Contact device for electrochemically deburring workpieces. 3,869,373, Cl. 204-224.00M.
Schaefer, William L.: *See*—
Briar, Thomas J.; and Schaefer, William L., 3,869,268.
Schauermann, Floyd L.: *See*—
Wilt, Charles R., Jr.; and Schauermann, Floyd L., 3,868,779.
Scheiber, Werner, to Metallgesellschaft Aktiengesellschaft. Method of internally coating ducts with synthetic resin. 3,869,300, Cl. 117-17.000.
Scheinpflug, Hans: *See*—
Widdig, Arno; Kuhle, Engelbert; Grewe, Ferdinand; Kaspers, Helmut; Scheinpflug, Hans; and Frohberger, Paul-Ernst, 3,869,503.
Scherbatskoy, Serge A. Nuclear well logging. 3,869,608, Cl. 250-270.000.
Schering AG: *See*—
Arndt, Friedrich; and Boroschewski, Gerhard, 3,869,275.
Scheuerman, Ronald F.: *See*—
Lybarger, James H.; Scheuerman, Ronald F.; and Karnes, George Thomas, 3,868,996.
Lybarger, James H.; Scheuerman, Ronald F.; and Karnes, George Thomas, 3,868,998.
Schiffman, Murray M., to Cambridge Research and Development Group; Greenberg, Sanford D.; DT Liquidating Partnership; and Shiffman, Murray M. Speech compressor with gap filling. 3,869,708, Cl. 360-8.000.
Schippers Freres: *See*—
Schippers, Jacob Kees, 3,868,907.
Schippers, Jacob Kees, to Schippers Freres. Hooking device for a ski-lift tow bar and ski-lift including said bars. 3,868,907, Cl. 104-173.000.
Schirmann, Jean-Pierre: *See*—
Weiss, Francis; Schirmann, Jean-Pierre; and Mathais, Henri, 3,869,541.
Schirtzinger, Joseph F., to Air Logistics Corporation. Semi-submerged cargo transport system. 3,868,920, Cl. 114-16.00R.
Schladitz, Hermann J. Process for vaporizing fuel oil. 3,869,242, Cl. 431-11.000.
Schlage Lock Company: *See*—
Izdebski, Wladyslaw, 3,869,386.
Schlanger, Gabriel Gary: *See*—
Kolensky, Leo Michael; Pile, Randolph John; Schlanger, Gabriel Gary; and Willand, Allan Howard, 3,869,573.
Schlickeiser, Klaus. Digital storage having a plurality of information sequences in a single track. 3,869,715, Cl. 360-48.000.
Schlinger, Warren G.: *See*—
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Schlumberger Technology Corporation: *See*—
Sandier, Gerard; and Nels, Jean-Paul, 3,869,607.
Schmadeke, Wolfgang; and Wilmers, Gottlieb. Internal seal for the piston of a rotary engine. 3,869,230, Cl. 418-142.000.
Schmalbach-Lubeca-Werke Aktiengesellschaft: *See*—
Himstedt, Kurt, 3,869,063.
Schmidt, Josef, to Bell & Howell Company. Interlock means responsive to track selection. 3,869,718, Cl. 360-60.000.
Schmidt, Robert: *See*—
Jager, Gerhard; Metzger, Carl; Eue, Ludwig; and Schmidt, Robert, 3,869,490.
Schmieder, Helmut: *See*—
Goldacker, Hubert; Hausberger, Helmut; and Schmieder, Helmut, 3,869,374.
Schmit, Francis M., to Honeywell, Inc. Optical memory with improved signal-to-noise ratio. 3,869,193, Cl. 350-6.000.
Schmoegner, John C.; and Burger, Norman P., to MDT Chemical Corp., by said John C. Schmoegner, a part interest. Aerosol dispensing container for separately stored fluids. 3,869,070, Cl. 222-193.000.
Schmutz, Lawrence E.: *See*—
Aldrich, Ralph E.; Feinleib, Julius; and Schmutz, Lawrence E., 3,869,195.
Schnabele, Werner; Knoche, Georg; and Zeyher, Fritz, to Messerschmitt-Bolkow-Blohm GmbH. Infantry missile for combat against ground targets. 3,869,101, Cl. 244-3.100.
Schneider, Herbert, to Rosan Enterprises. Rope having tension-cushioning shock absorber. 3,869,114, Cl. 267-69.000.

Schneider, Richard C.; and Viele, Lawrence, Jr., to International Business Machines Corporation. Method and apparatus for controlling the risetime of a digital magnetic recording waveform. 3,869,714, Cl. 360-45.000.

Schneider, Wilhelm: *See*—
Mayerhoffer, Herbert; Schneider, Wilhelm; Nuring, Hardo; and Exner, Wolfgang, 3,869,262.

Scholin, Harold W., to Scholin Industries, Inc. Stepping motor. 3,868,861, Cl. 74-129.000.

Scholin Industries, Inc.: *See*—
Scholin, Harold W., 3,868,861.

schollmeier, Gero: *See*—
Grutzmann, Sigmar; Sailer, Heinz; and schollmeier, Gero, 3,869,670.

Scholz, Berthold: *See*—
Eisenlohr, Karl-Heinz; Markwort, Helmut; and Scholz, Berthold, 3,869,377.

Schonewald, Roger L., to Improved Machinery Inc., 02. Molding apparatus including article cooling. 3,869,236, Cl. 425-144.000.

Schrecker, Howard D.; and Diekhoff, Hans H., to Aluminum Company of America. Method and apparatus for forming easy opening container walls. 3,868,919, Cl. 113-121.00C.

Schroder, Wolfgang, to International Standard Electric Corporation. Method of and circuit arrangement for operating a control-signal transmitter for remote-control equipment. 3,869,671, Cl. 325-118.000.

Schroder, Wolfgang, to International Standard Electric Corporation. Method and arrangements for the digital control of operating functions, radio and television receivers. 3,869,672, Cl. 325-392.000.

Schubach, Theodor C., to Rohr Industries Inc. Flush joint structure for adjoining panels. 3,868,802, Cl. 52-471.000.

Schubach, Theodor C., to Rohr Industries, Inc. Unitary fuel tank-bolster for bus with removable power unit. 3,869,012, Cl. 180-11.000.

Schubert, Ernst, to Chemische Fabrik Richard Geiss. Process for regenerating contaminated perchlorcethylene. 3,869,353, Cl. 203-38.000.

Schuller, James J., to Pullman Incorporated. Lock arrangement for box car doors. 3,869,162, Cl. 292-283.000.

Schultz, John C., to Houdaille Industries, Inc. Railway car suspension motion control system. 3,868,910, Cl. 105-164.000.

Schultz, John C., to Houdaille Industries, Inc. Railway car suspension motion control system. 3,868,911, Cl. 105-164.000.

Schulz, Friedhelm, to Gesellschaft fur Kernforschung mbH. Glow cathode. 3,869,632, Cl. 313-346.000.

Schulz, William E., to United States of America, Navy. Automatic latch/unlatch mechanism. 3,868,922, Cl. 114-235.00A.

Schundehutte, Karl-Heinz, to Farbenfabriken Bayer Aktiengesellschaft. Pigments comprising salts or complexes of polyvalent metals and azo-barbituric acid. 3,869,439, Cl. 260-146.00D.

Schupak, Eugene: *See*—
Schweitzer, Arthur J., Jr.; and Schupak, Eugene, 3,869,329.

Schutte, August H.; and Stevens, James T., to Arthur D. Little, Inc. Method for decomposing concentrated aqueous aluminum nitrate solutions. 3,869,543, Cl. 423-390.000.

Schutte, Robert, to Canada-Cities Service Ltd.; Imperial Oil Limited; Atlantic Richfield Canada Ltd.; and Gulf Oil Canada Limited. Tailings disposal system for tar sands plant. 3,869,384, Cl. 210-44.000.

Schwartz, Ralph E., to Ovitron Research Corporation. Method and means for preserving comestibles. 3,868,828, Cl. 62-196.000.

Schwartzman, Everett H. Evaporation system as for the conversion of salt water. 3,869,351, Cl. 202-172.000.

Schwarz, Josef: *See*—
Kuhnle, Ernst; and Schwarz, Josef, 3,869,008.

Schweitzer, Arthur J., Jr.; and Schupak, Eugene, to Allied Chemical Corporation. Method of sealing nylon film using boiling water or steam. 3,869,329, Cl. 156-308.000.

Schweizerische Isola-Werke: *See*—
Mosimann, Hans; Heim, Peter; and Borer, Charles, 3,869,428.

Schwenk, Kurt, to Volkswagenwerk Aktiengesellschaft. Vehicle with impact-absorbing end portion. 3,869,164, Cl. 293-63.000.

Schwenk, Willi. Multiway valve. 3,868,969, Cl. 137-625.500.

Schwind, Roger A.: *See*—
De Witt, Robert; Jepson, Bernhart E.; and Schwind, Roger A., 3,869,255.

Scoggins, Lacey E.: *See*—
Campbell, Robert W.; and Scoggins, Lacey E., 3,869,434.

Scott, Kenneth A.: *See*—
Cherry, Wesley R.; and Scott, Kenneth A., 3,869,357.

Scott, William B., to General Motors Corporation. Fluid unit rotor and method of manufacture. 3,869,258, Cl. 29-156.8FC.

Sczerba, Stanley T., to Pennsylvania Engineering Corporation. Furnace charging apparatus. 3,869,051, Cl. 214-18.0SC.

Sealectro Corporation: *See*—
Bingham, Chalice, 3,869,187.

Seaman, Beverly A. H.: *See*—
Niles, Earl Thomas; Seaman, Beverly A. H.; and Wilson, Edwin J., 3,869,544.

Sedlatschek, Karl: *See*—
Friedel, Rudolf; and Sedlatschek, Karl, 3,869,635.

Sehgal, Surendra N.: *See*—
Vezina, Claude; Saucier, Rene; and Sehgal, Surendra N., 3,869,346.

Seifried, Walter: *See*—
Janocha, Siegfried; Seifried, Walter; and Gebler, Horst, 3,869,533.

Seligman, Kurt Lothar: *See*—
Dawes, James Wilkinson; Seligman, Kurt Lothar; and Smith, Stanley George, 3,869,422.

Sell, Frank O.: *See*—
Patz, Roman J.; Sell, Frank O.; and Halbeck, Werner B., 3,869,586.

Selusnik, Jerome A.; Wolfe, Robert W.; Cartwright, William J.; and Tate, Oliver C., to Continental Can Company, Inc. Can depalletizer. 3,869,049, Cl. 214-8.50A.

Senour, Donald A. Solid state digital strain indicators. 3,868,848, Cl. 73-88.50R.

Sentourens, Michel Maurice Gerard, to Societe Nationale Industrielle Aerospatiale. Shaping machine with servo-assisted forming tool. 3,868,839, Cl. 72-21.000.

Service (Engineers) Limited: *See*—
Bradshaw, Arthur; and Meadows, Frank William, 3,868,902.

Sevinian, Kimik Tigranovich: *See*—
Koritsky, Andrei Vladimirovich; Ignatov, Viktor Alexandrovich; Polyak, Leonid Moiseevich; Shapiro, Semen Abramovich; Bokman, Grigory Aronovich; Mordvinov, Vladimir Alexandrovich; Zhizhin, Mikhail Ivanovich; Slonimsky, Alexandr Davydovich; Sevinian, Kimik Tigranovich; Adaskin, Semen Izrailovich; and German, Vladimir Vladimirovich, 3,869,628.

Seymour, David Jackson; MacRitchie, Norman; Matthews, Parker J.; and Clark, Thomas A., to Bowman, Jon G.; Boeing, William E.; and McCurdy, Wells, part interest to each. Normally vented liquid-storage tank for ships, with closure device for automatically preventing leaking if the ship should sink. 3,868,921, Cl. 114-74.00R.

Sezaki, Nobuhiko; and Ukena, Kohji, to Matsushita Electric Industrial Co., Ltd. Apparatus for automatic computation of cardiothoracic ratio. 3,869,602, Cl. 235-151.300.

Shaffer, Paul D.; Imler, Vaughn R.; and Morrissey, Jack D., to PPG Industries, Inc. Shaping glass sheets. 3,869,271, Cl. 65-273.000.

Shall, Sydney: *See*—
Lindsay, David Gordon; and Shall, Sydney, 3,869,437.

Shantz, John T.: *See*—
Hampton, Richard John; Shantz, John T.; Gallo, Thomas; and Unger, Peter, 3,869,558.

Shapiro, Semen Abramovich: *See*—
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Sharkey, Melvin: *See*—
Newman, Douglas A.; and Brown, Albert E., 3,869,307.

Shaw, Robert R.; and Snitzer, Elias, to American Optical Corporation. Neodymium doped acetate glass exhibiting fluorescence at 1.06 micrometers. 3,869,403, Cl. 252-301.30R.

Shaw, Robert R.; and Snitzer, Elias, to American Optical Corporation. Neodymium doped $Na_2O\text{-}P_2O_5\text{-}ZnCl_2$ glass exhibiting fluorescence at 1.06 micrometers. 3,869,404, Cl. 252-301.60P.

Shaw, Robert R.; and Snitzer, Elias, to American Optical Corporation. Glass exhibiting fluorescence at 1.06 micrometers. 3,869,405, Cl. 252-301.60S.

Shea, Frederick L.; Whittaker, Mack P.; and Grindstaff, Lloyd I., to Great Lake Carbon Corporation. Method for manufacture of graphite flour. 3,869,302, Cl. 117-46.0CC.

Shell Oil Company: *See*—
Herce, John A.; and Heath, James E., 3,869,408.
Lybarger, James H.; Scheuerman, Ronald F.; and Karnes, George Thomas, 3,868,996.
Lybarger, James H.; Scheuerman, Ronald F.; and Karnes, George Thomas, 3,868,998.
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Shen, Tsung-Ying; and Jones, Howard, to Merck & Co., Inc. 1,2,10-Tricarboxy phenanthrene compounds. 3,869,506, Cl. 260-514.500.

Shepherd, Bobby R.: *See*—
Warner, Ronald C.; and Shepherd, Bobby R., 3,869,043.

Sheppard, William L., to AVM Corporation. Valve assembly. 3,868,991, Cl. 165-38.000.

Shiba, Haruo: *See*—
Tanaka, Kimio; and Shiba, Haruo, 3,869,092.

Shiffman, Murray M.: *See*—
Schiffman, Murray M., 3,869,708.

Shimamura, Isao; and Iwano, Haruhiko, to Fuji Photo Film Co., Ltd. Process for treating waste photographic processing solutions. 3,869,383, Cl. 210-32.000.

Shimizu, Hiroshi, to Citizen Watch Co., Ltd. Apparatus for measuring a difference in time intervals of a timepiece. 3,868,845, Cl. 73-6.000.

Shimizu, Kyozo, to Nippon Electric Company, Limited. Logic gate circuit including a Schottky barrier diode. 3,869,622, Cl. 307-213.000.

Shimoyama, Takaitsu: *See*—
Gotoda, Masao; Yokoyama, Kenji; Kono, Yoshimi; Toyonishi, Shigekazu; Hiwano, Kunio; and Shimoyama, Takaitsu, 3,869,341.

Shindo, Hideyasu; Kumagai, Toshio; and Dot, Kengo, to Kowa Yakuhin Kogyo Kabushiki Kaisha. Tocopheryl-p-chlorophenoxyisobutyric acid ester. 3,869,477, Cl. 260-345.500.

Shinto Paint Co., Ltd.: *See*—
Suzuki, Tameyuki; Yasukawa, Junichi; Ishii, Teruhiko; Minami, Giiichi; Manabe, Yukihiro; and Nishimura, Mitsuo, 3,869,366.

Shiraishi, Satoshi; Fujiwara, Kunio; Kumagai, Yasuhiko; and Kurosaki, Shiro, to Sumitomo Electric Industries Ltd. Fiber for optical communication. 3,869,194, Cl. 350-96.0WG.

Shirrell, Clarence Lee, to Rosecon, Inc. Method of manufacturing floating boat dock modules. 3,869,532, Cl. 264-71.000.

Shishkov, Nikolai Ivanovich: *See*—
Tsantker, Karl Lazarevich; Logvinenko, Dmitry Danilovich; Shelyakov, Oleg Parfirovich; Verich, Vadim Pavlovich; Skrypnik, Alexandr Vasilievich; and Shishkov, Nikolai Ivanovich, 3,869,251.

Shively, Edgar E. Hand covering with heating means therein. 3,869,594, Cl. 219-211.000.

Shoji, Akira; Toda, Takao; Tanaka, Kano; and Hirashima, Takashi, to Canon Kabushiki Kaisha. Film cutting device. 3,868,877, Cl. 83-210.000.

Shoji, Magozo; and Kitamura, Motoharu, to Matsushita Electric Works, Ltd. Quick charging apparatus. 3,869,657, Cl. 320-39.000.

Showa Denko Kabushiki Kaisha: *See*—
Sato, Chosei; Yamada, Yasutoku; and Takenaka, Yoshiyuki, 3,869,537.

Shropshire, Kenneth W.: *See*—
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Shuster, Edward J.: *See*—
Hall, John B.; and Shuster, Edward J., 3,869,411.

Siefert, August C. Impact resistant inorganic composites. 3,869,335, Cl. 161-143.000.

Siegman, Anthony E.: *See*—
United States of America, National Aeronautics and Space Administration; and Siegman, Anthony E., 3,869,210.

Siemens Aktiengesellschaft: *See*—
Auspurg, Heinz; Huber, Josef; Rabold, Jurgen; and Wohlert, Gunther, 3,869,603.
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Thon, Friedrich, 3,869,611.

Signetics Corporation: *See*—
Davis, Stanley R., 3,869,321.
Grebene, Alan B., 3,869,679.

Sigrist, Willy. Apparatus for determining the amount of the dispersed phase in a suspension. 3,869,209, Cl. 356-103.000.

Sigulas, George N.: *See*—
Menne, Joseph D.; and Sigulas, George N., 3,868,885.

Silver Eagle Manufacturing Co., Inc.: *See*—
Gaussoin, Julius; Nottingham, Robert B.; and Reichard, Robert E., 3,869,617.

Silverman, Lawrence: *See*—
Haller, John Jacob; and Silverman, Lawrence, 3,869,699.

Silverwood, Hartley A., to McCord Corporation. Adhesion of urethane foams to pvc skins. 3,869,531, Cl. 264-46.6AP.

Simovits, Stephen S., Jr.: *See*—
Dumas, Christ J.; and Simovits, Stephen S., Jr., 3,869,633.

Singerman, Sol: *See*—
Olsson, David Lawrence; and Singerman, Sol, 3,869,044.

Singh, Balwant, to American Cyanamid Company. Generation of photofluorescent materials by short wavelength ultraviolet irradiation of non-fluorescent bis-diarylchloromethyl-1,3,4-oxadiazoles. 3,869,363, Cl. 204-158.00R.

Sinitsyn, Viktor Alexeevich: *See*—
Orlov, Vladimir Alexandrovich; Zaitseva, Vera Dmitrievna; Sinitsyn, Viktor Alexeevich; and Rostovtseva, Ekaterina Efimovna, 3,869,303.

Siragusa, Judith Ann: *See*—
Steiger, Fred Harold; and Siragusa, Judith Ann, 3,868,955.

Skau, Evald L.: *See*—
Mod, Robert R.; Magne, Frank C.; Skau, Evald L.; and Sumrell, Gene, 3,869,483.

SKF Industrial Trading and Development Company: *See*—
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Skrypnik, Alexandr Vasilievich: *See*—
Tsantker, Karl Lazarevich; Logvinenko, Dmitry Danilovich; Shelyakov, Oleg Parfirovich; Verich, Vadim Pavlovich; Skrypnik, Alexandr Vasilievich; and Shishkov, Nikolai Ivanovich, 3,869,251.

Slonimsky, Alexandr Davydovich: *See*—
Koritsky, Andrei Vladimirovich; Ignatov, Viktor Alexandrovich; Polyak, Leonid Moiseevich; Shapiro, Semen Abramovich; Bokman, Grigory Aronovich; Mordvinov, Vladimir Alexandrovich; Zhizhin, Mikhail Ivanovich; Slonimsky, Alexandr Davydovich; Sevinian, Kimik Tigranovich; Adaskin, Semen Izrailovich; and German, Vladimir Vladimirovich, 3,869,628.

Smars, Erik; Mogensen, Palne; and Kaij, Mats J., to AGA Aktiebolag. Reactor for plasma-chemical processes. 3,869,616, Cl. 250-547.000.

Smee, Graham John; and Miller, Anthony Owen, to British Insulated Callender's Cables Limited. Jointing metal cable sheaths. 3,868,771, Cl. 29-628.000.

Smialkowski, Bruno: *See*—
Stoeber, Alfred; and Smialkowski, Bruno, 3,869,218.

Smith, Clyde, to Columbia Broadcasting System, Inc. Pulse-width-modulated converter for television system. 3,869,566, Cl. 178-7.200.

Smith, Donald A.: *See*—
La Marre, David A.; Smith, Donald A.; and Stickney, Herbert F., 3,868,726.

Smith, Edwin J.; and Reif, Robert B., to National Steel Corporation. Electrostatic coating of metal powder on metal strip. 3,868,925, Cl. 118-621.000.

Smith, George L., Jr.; and Diekhoff, Hans H., to Aluminum Company of America. Lock-down for a pull tab on a container wall. 3,868,918, Cl. 113-121.00C.

Smith, Stanley George: *See*—
Dawes, James Wilkinson; Seligman, Kurt Lothar; and Smith, Stanley George, 3,869,422.

SmithKline Corporation: *See*—
Mechoulam, Raphael; Houry, Shlomo; and Loev, Bernard, 3,869,475.

Smiths Industries Limited: *See*—
Beardmore, Geoffrey; and Evans, Hugh N., 3,869,368.

Snead, William K.; and McGreevy, Robert E., to PPG Industries, Inc. Method for producing potassium azide. 3,869,542, Cl. 423-410.000.

Snitzer, Elias: *See*—
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Shaw, Robert R.; and Snitzer, Elias, 3,869,404.
Shaw, Robert R.; and Snitzer, Elias, 3,869,405.

Snowden, Charles H., to Xerox Corporation. Fuser apparatus. 3,869,696, Cl. 240-52.00R.

Snyder, Richard V., to Lorch Electronics Corporation. Asymmetric quadrature hybrid couplers. 3,869,585, Cl. 179-173.000.

Societa Italiana Resine S.I.R. S.p.A.: *See*—
Vargiu, Silvio; Giovanni, Sesto S.; Mazzoleni, Giorgio; and Pezzoli, Silvestro, 3,869,387.

Societe Anonyme dite: L'Oreal: *See*—
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Societe Anonyme: Poclain: *See*—
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Societe Chimique de la Grande paroisse, Azote et produits Chimiques: *See*—
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Societe Chimique des Charbonnages: *See*—
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Societe d'Etudes et d'Exploitation de Marques et Brevets-S.E.M.S.: *See*—
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Societe Financiere et Industrielle des Ateliers et Chantiers de Bretagne: *See*—
Moreau, Claude, 3,868,897.

Societe Industrielle de Transports Automobiles (Societe Anonyme): *See*—
Michel, Jean-Claude, 3,869,050.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Grunert, Wilhelm; and Briotet, Jean Paul Francois Gilbert, 3,868,971.

Societe Nationale Industrielle Aerospatiale: *See*—
Sentourens, Michel Maurice Gerard, 3,868,839.

Societe Nouvelle de Roulements: *See*—
Sonnerat, Claude, 3,869,180.

Soininen, Mauri; Koponen, Martti; and Holopainen, Vesa, to Valmet Oy. Group of drying cylinders in a multiple cylinder dryer for a material web, in particular for paper. 3,868,780, Cl. 34-116.000.

Sokoloski, Martin M., to United States of America, Army. Variable broadband delay line. 3,869,683, Cl. 333-30.00R.

Solartron Electronic Group Limited, The: *See*—
Metcalf, Eric, 3,869,601.

Soleman, Mohamad Ali Arafien: *See*—
Graveland, Antonie; Geerligs, Wouter Louis Prinsen; and Soleman, Mohamad Ali Arafien, 3,869,381.

Sollman, Paul B., to G. D. Searle & Co. 17Alpha-alkanoyloxy-6alpha-methyl-3beta-trialkyl-siloxypregn-4-en-20-ones. 3,869,481, Cl. 260-397.400.

Sommer, Paul; and Tschirky, Hansjorg, to Hoffmann-La Roche Inc. Metering apparatus. 3,869,225, Cl. 417-430.000.

Sommerkamp, Peter: *See*—
Patz, Ulrich F. M.; Sommerkamp, Peter; and Josephy, Julius, 3,869,675.

Sondell, Jan Ivar: *See*—
Hellman, Per Ingvar; Sondell, Jan Ivar; and Jershed, Bo Christian, 3,869,318.

Sonnerat, Claude, to Societe Nouvelle de Roulements. Railway journal box bearing race mounting. 3,869,180, Cl. 308-180.000.

Sonoco Products Company: *See*—
Witzig, Werner, 3,869,325.

Sonstegard, David A.: *See*—
Kaufer, Herbert; Matthews, Larry S.; Sonstegard, David A.; and Murray, Ian P., 3,868,730.

Sony Corporation: *See*—
Inaga, Katsu, 3,869,099.
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Yamagishi, Jin; and Momiyama, Hiroaki, 3,869,709.
Yamaoka, Nobutatu; and Takahashi, Yasunori, 3,869,398.
Yoshida, Kenji, 3,869,723.

Sorenson, Alvin A. Calibrated slot cutter. 3,868,887, Cl. 90-12.00B.

Soryu Sewing Machine Mfg. Co., Ltd., The: *See*—
Masaki, Noriyasu, 3,869,030.

Sosnowski, Stanislaw Jan Antoni, to C.A.V. Limited. Fuel pumping apparatus. 3,869,226, Cl. 417-462.000.

Sousek, Eugene A., to Koehring Company. Motor controlled material spreading vehicles. 3,869,655, Cl. 318-591.000.

Spanjer, Keith Gordon: *See*—
Hunter, William L.; and Spanjer, Keith Gordon, 3,869,704.

Spark, Loudon C.: *See*—
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Sparks, John W.: *See*—
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Spasiano, Anthony D.: *See*—
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Sperry Rand Corporation: *See*—
Green, Paul F., 3,869,085.
Mathias, Joseph S., 3,869,355.

Spica, Joseph P. Modules for through- and under-drawing flooring. 3,868,798, Cl. 52-100.000.

Spiewak, John Walter, to Firestone Tire & Rubber Company, The. Polyamides and their production. 3,869,431, Cl. 260-78.00L.

Spisak, Edward G., to S & S Product Engineering Service, Inc. Hub cap for vehicle wheels. 3,869,175, Cl. 301-37.00R.

Spitz, Erich; and Rembault, Michel, to Thomson-CSF. Speech-synthesis system. 3,869,575, Cl. 179-1.0SA.

Spitz, Melvin P.; and Sproule, John W., to Bedline Mfg. Co. Folding sofa-bed construction with adjustable head section. 3,868,733, Cl. 5-13.000.

Sprecher, Raymond G., to General Motors Corporation. Vehicle occupant restraint belt retractor. 3,869,098, Cl. 242-107.400.

Springer, Willi; and Bellmann, Walter, to Daimler-Benz Aktiengesellschaft. Method for assembly of a rotary piston internal combustion engine. 3,868,753, Cl. 29-156.40R.

Springmeyer, Allan H.: *See*—
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Sproul, Jared Sanford; and Rau, Eric, to Intermountain Research and Development. Process for producing sodium carbonate from trona. 3,869,538, Cl. 423-206.000.

Sproule, John W.: *See*—
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Sprowl, Donald: *See*—
Longley, Kermit D.; and Sprowl, Donald, 3,869,508.

Stahl, Joseph E.; and Cudworth, Allen L., to J. P. Stevens Co., Inc. Fly shuttle loom and parts thereof. 3,868,975, Cl. 139-1.00R.

Stahl, Oliver B.; and Paris, Carmen J. Closed cycle waste treatment system and method. 3,868,731, Cl. 4-10.000.

Stahlecker, Fritz, to Stahlecker, Wilhelm. Drive and brake mechanism for an open-end spinning assembly. 3,868,815, Cl. 57-88.000.

Stahlecker, Wilhelm: *See*—
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Standard Oil Company: *See*—
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Standard Pressed Steel Co.: *See*—
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Stanley, William L.; and Pittman, Allen G., to United States of America, Agriculture. Process for containing oil spills. 3,869,385, Cl. 210-53.000.

Statens Bakteriologiska Laboratorium: *See*—
Falksveden, Lars-Gunnar Albinsson, 3,869,436.

Stauffer Chemical Company: *See*—
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Stearns Manufacturing Co. Inc.: *See*—
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Steck, James R.: *See*—
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Stedman, Robert N., to Caterpillar Tractor Co. Crawler tractor. 3,869,010, Cl. 180-9.500.

Stedman, Robert N.: *See*—
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Steiger, Fred Harold; and Siragusa, Judith Ann, to Personal Products Company. Aldehyde polysaccharide dressings. 3,868,955, Cl. 128-296.000.

Stein, Richard W.: *See*—
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Stein, Robert George: *See*—
Crovetti, Aldo Joseph; Kenney, Donald Sykes; Lynch, Don Murl; and Stein, Robert George, 3,869,274.

Stein, Robert W.; and Stein, Richard W., to said Robert Stein, by said Richard Stein. Mathematical board game apparatus. 3,869,124, Cl. 273-131.0AC.

Steiner, Josef: *See*—
Friese, Karl-Hermann; Michel, Friedbert; Krauss, Rudolf; Jaggle, Gunther; Stumpp, Gerhard; Steiner, Josef; and Knapp, Heinrich, 3,868,939.

Steinhof Marketing Corporation Ltd., represented by the General Partners, Steinhof Associated GmbH: *See*—
Kranz, Vladimir, 3,869,118.

Stephan, Herbert: *See*—
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Sterling Drug Inc.: *See*—
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Lesher, George Y., 3,869,443.
Lesher, George Y.; and Gruett, Monte D., 3,869,464.

Sternis, Pierre. Extensible support element for protection canvas. 3,868,961, Cl. 135-4.00R.

Stevens, James T.: *See*—
Schutte, August H.; and Stevens, James T., 3,869,543.

Stickney, Herbert F.: *See*—
La Marre, David A.; Smith, Donald A.; and Stickney, Herbert F., 3,868,726.

Stiefken, Hans: *See*—
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Stinnett, Donald F.: *See*—
Der Marderosian, Aaron C.; Nelson, Paul E.; and Stinnett, Donald F., 3,869,662.

Stock, Ernest Rex, to E. R. Stock Proprietary Limited. Couplings. 3,868,831, Cl. 64-16.000.

Stocker, Raymond: *See*—
Grimes, Delmar C.; and Stocker, Raymond, 3,869,279.

Stoeber, Alfred; and Smialkowski, Bruno, to Art Shelf Product Company. Support structure. 3,869,218, Cl. 403-241.000.

Stone, Lawrence J.: *See*—
Doll, Robert M.; Jessup, Joseph L.; and Stone, Lawrence J., 3,868,896.

Stone, William M.: *See*—
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Stora Kopparbergs Bergslags Aktiebolag: *See*—
Hellman, Per Ingvar; Sondell, Jan Ivar; and Jershed, Bo Christian, 3,869,318.

Strand, Albert Thomas, to du Pont de Nemours, E. I., and Company. Process for producing an aqueous reaction product slurry of a diamine and a diacid. 3,869,400, Cl. 252-182.000.

Strange, Maxwell G., to United States of America, National Aeronautics and Space Administration. Self-regulating proportionally controlled heating apparatus and technique. 3,869,597, Cl. 219-505.000.

Stuhmer, Werner: *See*—
Milkowski, Wolfgang; Zeugner, Horst; Von Eickstedt, Klaus-Wolf; and Stuhmer, Werner, 3,869,459.

Stumpp, Gerhard: *See*—
Friese, Karl-Hermann; Michel, Friedbert; Krauss, Rudolf; Jaggle, Gunther; Stumpp, Gerhard; Steiner, Josef; and Knapp, Heinrich, 3,868,939.

Stunkard, Norman W., to Allis-Chalmers Corporation. Resistor for power distribution circuits. 3,869,691, Cl. 338-231.000.

Sugahara, Noboru: *See*—
Watanabe, Asao; Kasahara, Tadayoshi; and Sugahara, Noboru, 3,869,211.

Suggitt, Robert M.; and Crone, John M., Jr., to Texaco Inc. Method of hydroalkylating including regeneration of catalyst. 3,869,523, Cl. 260-668.00R.

Sugiyama, Shunichi: *See*—
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Sumitomo Chemical Company, Ltd.: *See*—
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Sumitomo Electric Industries Ltd.: *See*—
Kita, Yasuo, 3,869,695.
Shiraishi, Satoshi; Fujiwara, Kunio; Kumagai, Yasuhiko; and Kurosaki, Shiro, 3,869,194.

Sumrell, Gene: *See*—
Mod, Robert R.; Magne, Frank C.; Skau, Evald L.; and Sumrell, Gene, 3,869,483.

Sun Oil Company of Pennsylvania: *See*—
Pollock, Andre W.; and Durrett, James M., 3,869,378.

Sun Ventures, Inc.: *See*—
Cherry, Wesley R.; and Scott, Kenneth A., 3,869,357.

Sunaga, Hiromi: *See*—
Machi, Sueo; Kawamura, Keita; Kawakami, Waichiro; Aoki, Shingi; Hashimoto, Shoji; Yotumoto, Keiichi; and Sunaga, Hiromi, 3,869,362.

Sunbeam Corporation: *See*—
Wolter, Gilbert R.; Szymczak, Eugene B.; and Bruning, Elmer Eugene, 3,869,265.

Sunden, Bengt Fritiof, to LKG-produkter AB. Method in counter flow isotachophoresis. 3,869,365, Cl. 204-180.00R.

Superior Industries, Inc.: *See*—
Brown, Raymond C.; and Bokovoy, Ronald D., 3,869,174.

Surgical Equipment Supplies Limited: *See*—
Ellis, Gerard, 3,869,059.

Sutch, Brian Leo Chudleigh, to Airfix Industries Limited. Apparatus for producing composite containers. 3,868,893, Cl. 93-50.000.

Sutch, Brian Leo Chudleigh, to Airfix Industries Limited. Apparatus for molding and means for transferring a preform foil to the mold. 3,869,234, Cl. 425-112.000.

Sutherland, Robert L.; and Sutherland, Wayne M. Rope climbing apparatus. 3,869,021, Cl. 182-3.000.

Sutherland, Wayne M.: *See*—
Sutherland, Robert L.; and Sutherland, Wayne M., 3,869,021.

Suzuki, Morio; Tachibana, Masayoshi; and Moriai, Takayoshi, to Teikoku Kako Co., Ltd. Iron oxide pigments and process for the production thereof. 3,869,298, Cl. 106-304.000.

Suzuki, Tameyuki; Yasukawa, Junichi; Ishii, Teruhiko; Minami, Giichi; Manabe, Yukihiro; and Nishimura, Mitsuo, to Shinto Paint Co., Ltd. Method for electrocoating. 3,869,366, Cl. 204-181.000.

Suzuqui, Tsutomu: *See*—
Fukui, Tutomu; and Suzuqui, Tsutomu, 3,868,882.

Svenska Dataregister AB: *See*—
Englund, Gosta R.; and Myren, Rune L., 3,869,598.

Svenska Sockerfabriks Aktiebolaget: *See—*
Glifberg, Nils Bertil, 3,869,182.

Swedberg, Nils Einar, to Eaton Corporation. Axial pressure balancing means for a hydraulic device. 3,869,228, Cl. 418-132.000.

Sze, Morgan C.; and Wang, Ruey H., to Lummus Company, The. Acetaldehyde production. 3,869,518, Cl. 260-604.00R.

Szymczak, Eugene B.: *See—*
Wolter, Gilbert R.; Szymczak, Eugene B.; and Bruning, Elmer Eugene, 3,869,265.

Tabata, Yasuhiro; and Ukai, Takeshi, to Ricoh Co., Ltd. Electrophotographic copying machine. 3,869,202, Cl. 355-3.00R.

Tachibana, Masayoshi: *See—*
Suzuki, Morio; Tachibana, Masayoshi; and Moriai, Takayoshi, 3,869,298.

Tadanier, John Soloman: *See—*
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Taff, Frederick Nishwitz: *See—*
Bogulslawski, Jan Janusz; Geyer, Paul; and Taff, Frederick Nishwitz, 3,869,304.

Taiyo Yuden Kabushiki Kaish: *See—*
Yamaoka, Nobutatu; and Takahashi, Yasunori, 3,869,398.

Takada, Takezo, to Takata Kojyo Co. Ltd. Self-applying vehicle safety belt. 3,869,145, Cl. 280-150.0AB.

Takahashi, Katsushi. Apparatus for handling baking pans. 3,869,048, Cl. 214-8.50A.

Takahashi, Kunio: *See—*
Kenmochi, Hiroshi; Menju, Shinichi; and Takahashi, Kunio, 3,869,665.

Takahashi, Tohru: *See—*
Ohira, Tsunehisa; and Takahashi, Tohru, 3,869,720.

Takahashi, Yasunori: *See—*
Yamaoka, Nobutatu; and Takahashi, Yasunori, 3,869,398.

Takakura, Yoshio; Otake, Yukio; and Imai, Yukiyoshi, to Hitachi, Ltd. Oscillating flying shear. 3,868,879, Cl. 83-316.000.

Takata Kojyo Co. Ltd.: *See—*
Takada, Takezo, 3,869,145.

Takemoto, Katsumi: *See—*
Sawada, Yuji; Takemoto, Katsumi; and Maruoka, Yasuro, 3,869,028.

Takenaka, Yoshiyuki: *See—*
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Takeuchi, Tomio: *See—*
Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, 3,869,347.

Tanabe Seiyaku Co., Ltd.: *See—*
Miura, Yuji; Nagao, Taku; Sato, Masanori; Nakajima, Hiromichi; and Kawanishi, Masazumi, 3,869,474.

Tanaka, Kano: *See—*
Shoji, Akira; Toda, Takao; Tanaka, Kano; and Hirashima, Takashi, 3,868,877.

Tanaka, Kimio; and Shiba, Haruo, to TDK Electronics Co., Ltd. Endless tape cartridge. 3,869,092, Cl. 242-55.19A.

Tantlinger, Keith W., to Rohr Industries Inc. Snap-on mullion cover with scored breakaway flange portions. 3,868,804, Cl. 52-98.000.

Tarter, James H.; Read, Ronald G.; Colussi, Valentino; and McCain, David L., to Continental Oil Company. Conveyer for slurry hose transportation system. 3,868,964, Cl. 137-344.000.

Tarzia, Giorgio, to Gruppo Lepetit S.p.A. 2-Substituted oxazole-4,5-dicarboxamides. 3,869,468, Cl. 260-307.00R.

Tate, Oliver C.: *See—*
Selusnik, Jerome A.; Wolfe, Robert W.; Cartwright, William J.; and Tate, Oliver C., 3,869,049.

Tateishi, Arthur Katsumi. Speed changer for phonograph record player. 3,869,129, Cl. 274-9.00B.

Tayler, Colin Andrew Miller, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Rotary machines. 3,869,220, Cl. 415-56.000.

Taylor, David W.: *See—*
Long, Kenneth E.; and Taylor, David W., 3,869,356.

Taylor, Dudley D.; Sadoff, Bernard J., Jr.; and Halling, Horace P., to Pressure Science, Inc. Fire resistant sealing ring combination. 3,869,132, Cl. 277-26.000.

Taylor, Harold M.; Davenport, James D.; and Hackler, Ronald E., to Eli Lilly and Company. Synthesis of 5-pyrimidinecarbinols. 3,869,456, Cl. 260-251.000.

TDK Electronics Co., Ltd.: *See—*
Tanaka, Kimio; and Shiba, Haruo, 3,869,092.

Teagno, Wladimiro, to AMP Incorporated. Electrical connector assembly. 3,869,185, Cl. 339-65.000.

Teague, Troy L.: *See—*
Murphy, Frank W., Jr.; Carlton, Lewis M.; and Teague, Troy L., 3,868,855.

Teikoku Kako Co., Ltd.: *See—*
Suzuki, Morio; Tachibana, Masayoshi; and Moriai, Takayoshi, 3,869,298.

Tejeda, Alvaro R., to J. Vast Associates, Inc. System for inhibiting attack on a ferrous anode electrode in an electrodialytic cell. 3,869,364, Cl. 204-301.000.

Tejeda, Alvaro R. System for demineralizing water by electrodialysis. 3,869,376, Cl. 204-301.000.

Tejeda, Alvaro R., to J. Vast Associates, Inc. Method and apparatus for determining exhaustion of a mass of ion exchange material and a device using the same. 3,869,382, Cl. 210-30.000.

Teledyne, Inc.: *See—*
Maddox, Edward L.; and Pease, Robert A., 3,868,857.

Teledyne Mid-America Corporation: *See—*
Henry, Richard J.; and Cary, Robert A., 3,869,037.

Teleflex Incorporated: *See—*
Brumbaugh, Robert J., 3,869,293.

Telefunken Compter GmbH: *See—*
Hanke, Martin; and Stiefken, Hans, 3,869,658.

Tellier, J. C. Tristan, to GAF Corporation. Electrostatic toner composition. 3,869,397, Cl. 252-62.100.

Temec Limited: *See—*
Williams, John, 3,869,415.

Temme, Helmut; and Kohler, Oscar, to Gewerkschaft Eisenhutte Westfalia. Scraper assemblies for scraper chain conveyors. 3,869,039, Cl. 198-175.000.

Terada, Kazuji; and York, Buddy L., to Dow Chemical Company, The. Preparation of aluminum hydride. 3,869,545, Cl. 423-645.000.

Terasaki, Shuji: *See—*
Yoshikawa, Shinsuke; Sasaki, Tohru; Ota, Mitsuru; Terasaki, Shuji; and Funakoshi, Akira, 3,869,534.

Terrell, Ross C., to Airco, Inc. Fluorinated ether. 3,869,519, Cl. 260-614.00F.

Texaco Inc.: *See—*
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Christopher, Charles A., Jr.; and Satter, Abdus, 3,868,999.
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Texas Instruments Incorporated: *See—*
Carter, David L., 3,869,572.

Thettu, Raghulinga R., to Xerox Corporation. Cleaning apparatus for heated pressure roll fuser. 3,868,744, Cl. 15-256.520.

Thies, Peter Willibrord; Kucaba, Walter; and Funke, Siegfried, to Kali-Chemie Aktiengesellschaft. Therapeutically active isovaleric acid esters. 3,869,476, Cl. 260-345.200.

Thompson, John R., to United States of America, Navy. Underwater electrical power leakage current detector. 3,869,668, Cl. 324-133.000.

Thompson, Woodford R., Jr.: *See—*
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Thompson, Woodrow F. Golf club face. 3,869,126, Cl. 273-175.000.

Thomson - CSF: *See—*
Peltier, Jean Paul, 3,869,706.
Spitz, Erich; and Rembault, Michel, 3,869,575.

Thomson, Ronald E.; and Kast, Philip J., to Madison-Kipp Corporation. Mechanical lubricating device and method. 3,869,023, Cl. 184-15.00A.

Thon, Friedrich, to Siemens Aktiengesellschaft. Particle-beam device of the raster type. 3,869,611, Cl. 250-311.000.

Thorel, Jean. Polygnomonic map of the world comprising two hemispheres. 3,868,781, Cl. 35-42.000.

Thornton, Henry M., Jr. Wardrobe apparel case. 3,869,034, Cl. 190-13.00R.

Thurman, Robert K., to Merritt Division of Murphy Pacific Marine Salvage. Modular oil containment boom. 3,868,824, Cl. 61-1.00F.

Tichenor, George Humphrey. Portable knitting device for use at home or in like places. 3,868,834, Cl. 66-1.00A.

Tiquet, Jacques; and Cros, Jean-Louis, to Societe Chimique des Charbonnages. Process of manufacturing tert.-butyl p-tert. butylperbenzoate. 3,869,489, Cl. 260-453.00R.

Titterington, Joseph Bell: *See—*
Jackson, Sydney; and Titterington, Joseph Bell, 3,869,260.

Toda, Takao: *See—*
Shoji, Akira; Toda, Takao; Tanaka, Kano; and Hirashima, Takashi, 3,868,877.

Todd-Reeve, Leslie, to Hoover Company, The. Combination washer-dryer drive arrangement. 3,868,835, Cl. 68-20.000.

Toho Beslon Co., Ltd.: *See—*
Saji, Yasuo; and Ikegami, Shigeru, 3,868,816.

Tojima, Toshiaki: *See—*
Kishimoto, Kyuji; Tojima, Toshiaki; and Ishii, Hideto, 3,868,928.

Tokarev, Petr Pavlovich: *See—*
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Tokyo Electric Power Co., Ltd.: *See—*
Kenmochi, Hiroshi; Menju, Shinichi; and Takahashi, Kunio, 3,869,665.

Tokyo Shibaura Co., Ltd.: *See—*
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Tolkachev, Alexei Efimovich: *See—*
Malygin, Petr Vasilievich; Kochetkov, Valentin Mikhailovich; and Tolkachev, Alexei Efimovich, 3,868,966.

Tolnar, Emil J., Jr.; and Winyard, Arthur H., to General Motors Corporation. Connector means having shorting clip. 3,869,191, Cl. 339-111.000.

Tongurian, Grigore. Machine for reconditioning and setting diaphragm type and lever type clutches. 3,868,755, Cl. 29-200.00J.

Topilin, Valentin Vasilievich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Puzrin, Leo-

nid Gustavovich; Gorodetsky, Avram Shaevich; Ischenko, Jury Yakovlevich; Pryanishnikov, Igor Stepanovich; Zhuchin, Vladimir Nikiforovich; Topilin, Valentin Vasilievich; Kljuev, Mikhail Markovich; Laktionov, Vladimir Sergeevich; Grebtsov, Jury Grigorievich; Perepelitsa, Igor Vasilievich; Fomicheva, Nina Petrovna; Boiko, Georgy Alexandrovich; Kirsenko, Anatoly Antonovich; Rozanov, Dmitry Pavlovich; and Karlov, Stanislav Vasilievich, 3,869,592.

Torama, Tadashi: *See—*
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Torick, Emil L.: *See—*
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Torpey, Wilbur N., to Autotrol Corporation. Treatment of wastewater. 3,869,380, Cl. 210-17.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
Sato, Mitsuharu, 3,868,763.

Toth, Jozsef. Reciprocating engine. 3,868,932, Cl. 123-54.00B.

Townsend Engineering Company: *See—*
Townsend, Ray T.; and Beasley, Donald L., 3,868,747.

Townsend, Ray T.; and Beasley, Donald L., to Townsend Engineering Company. Apparatus for encasing a product. 3,868,747, Cl. 17-34.000.

Toyo Kogyo Co., Ltd.: *See—*
Kurio, Noriyuki, 3,869,229.

Toyonishi, Shigekazu: *See—*
Gotoda, Masao; Yokoyama, Kenji; Kono, Yoshimi; Toyonishi, Shigekazu; Hiwano, Kunio; and Shimoyama, Takaitsu, 3,869,341.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Bunda, Tsuchio; Niimi, Itaru; Kaneko, Yasuhisa; and Noda, Fumiyoshi, 3,869,410.

Traber, Walter; and Karrer, Friedrich, to Ciba-Geigy Corporation. Ketones. 3,869,515, Cl. 260-590.000.

Trass, Alan Neville. Transistor ignition system. 3,868,938, Cl. 123-148.00E.

Travor, Bruce W.; and Pitney, Lennord L., to United States of America, Army. Sampling mechanism. 3,868,854, Cl. 73-421.500.

Trentesaux-Toulemonde S.A.: *See—*
Sander, Pierre; and Mullier, Christian, 3,869,336.

Trivette, Chester D., Jr., to Monsanto Company. Method for cross-linking rubber. 3,869,435, Cl. 260-79.50C.

Trost, Edward; and Martin, Clifford E., to Mohawk Data Sciences Corporation. Optical character recognition video amplifier and digitizer. 3,869,698, Cl. 340-146.3AG.

Trueb, Viktor: *See—*
Weick, Heinz Hermann; Trueb, Viktor; and Hesener, Walter, 3,869,094.

Trus Joist Corporation: *See—*
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Trusch, Raymond B.: *See—*
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TRW Inc.: *See—*
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Vetter, Ottomar H., 3,869,186.

Tsantker, Karl Lazarevich; Logvinenko, Dmitry Danilovich; Shelyakov, Oleg Parfirovich; Verich, Vadim Pavlovich; Skrypnik, Alexandr Vasilievich; and Shishkov, Nikolai Ivanovich. Apparatus for intermixing materials in a reaction vessel containing ferromagnetic particles. 3,869,251, Cl. 23-252.00R.

Tschierse, Klaus, to Berliner Maschinenban-Actien-Gesellschaft. Method and apparatus for checking metallic objects by monitoring its effect on one cycle of an alternating field. 3,869,663, Cl. 324-41.000.

Tschirky, Hansjorg: *See—*
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Tsemakhovich, Boris Davydovich: *See—*
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Tucker, James M., to McDonnell Douglas Corporation. Guidance system. 3,868,883, Cl. 89-1.800.

Tudor Games, Incorporated: *See—*
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Tufts, Guy O.: *See—*
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Tugaudis, Ernest A.: *See—*
Humphrey, Marion L.; and Tugaudis, Ernest A., 3,869,582.

Turner, John Cameron; and Chan, Rosalind Po Kuen, to Biorex Laboratories, Limited. 3'-O-Acetyl-18'-glycyrrhetyl-N-carboethoxy piperazinoamides. 3,869,458, Cl. 260-268.0PC.

Tuura, Martti Johannes, to A. Ahlstrom Osakeyhtio. Carton blank with turn down closures. 3,869,077, Cl. 229-16.00D.

Tween, Jack: *See—*
Cove, Anthony Raymond; and Tween, Jack, 3,868,960.

Twiehaus, Marvin J.: *See—*
Mebus, Charles A.; and Twiehaus, Marvin J., 3,869,547.

Tyrone Hydraulics, Inc.: *See—*
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Ubukata, Susumu; and Mizutani, Yasukazu, to said Ubukata, by said Mizutani. Positive or negative acceleration operated conductive liquid switch for vehicle safety devices. 3,869,588, Cl. 200-61.470.

Ubukata, Susumu: *See—*
Ubukata, Susumu; and Mizutani, Yasukazu (assors. to said Ubukata, by said Mizutani), 3,869,588.

Ueda, Kazuo, to Ueda Works Co., Ltd. Hemadynamometer microphone. 3,868,954, Cl. 128-2.05S.

Ueda, Seiichi; and Minagawa, Teruo, to Hitachi, Ltd. Synchronization separator circuit. 3,869,568, Cl. 178-7.30S.

Ueda Works Co., Ltd.: *See—*
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Ukai, Takeshi: *See—*
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Ukena, Kohji: *See—*
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Ulrich, George W.: *See—*
United States of America, National Aeronautics and Space Administration; and Ulrich, George W., 3,869,160.

Umezawa, Hamao; Miyano, Tetsuji; Funaishi, Kohtaro; Takeuchi, Tomio; and Aoyagi, Takaaki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Process for the production of new pepstatins having anti-pepsin activity. 3,869,347, Cl. 195-80.00R.

Underwood, James H.: *See—*
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Unger, Peter: *See—*
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Union Carbide Corporation: *See—*
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United Aircraft Corporation: *See—*
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United Artists Music and Records Group, Inc.: *See—*
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defense in Her Britannic Majisty's Government of the: *See—*
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Finley, John W.; Hautala, Earl; and Walker, Charles E., 3,869,438.
Hasegawa, Shin; and Brewster, Linda C., 3,869,345.
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Rockland, Louis B.; Zaragosa, Eufrocina M.; and Hahn, Dulcie M., 3,869,556.
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National Aeronautics and Space Administration; administrator; with respect to an invention of:
Kuhn, Ralph F., Jr. Internally supported flexible duct joint. 3,869,151, Cl. 285-114.000.
O'Neill, Robert W. Peak holding circuit for extremely narrow pulses. 3,869,624, Cl. 307-267.000.
Osmundson, John; Rowe, H. Edward; and Santarpia, Dominick. Dually mode-locked nd:yag laser. 3,869,680, Cl. 331-94.50M.
Siegman, Anthony E. Laser system with an antiresonant optical ring. 3,869,210, Cl. 356-106.0LR.
Trusch, Raymond B.; and O'Connor, Edward W. Condensate removal device for heat exchanger. 3,868,830, Cl. 62-290.000.
Ulrich, George W. Latching device. 3,869,160, Cl. 292-108.000.
Zuckerwar, Allan J. Instrumentation for measurement of aircraft noise and sonic boom. 3,868,856, Cl. 73-557.000.
National Aeronautics and Space Administration: *See—*
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U.S. Philips Corporation: *See—*
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United States Surgical Corporation: *See—*
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Urban, John A.; Hopkins, Gary L.; and Armstrong, John Keith, to Eaton Corporation. Pneumatic anti-skid control brake system with an emergency brake control valve. 3,869,177, Cl. 303-21.00F.

Uskokovic, Milan Radoje: *See—*
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USUI Kokusai Sangyo Kabushiki Kaisha: *See—*
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Usui, Setsuo, to Sony Corporation. Alpha-numeric display device utilizing light emitting diodes. 3,869,637, Cl. 313-500.000.

V.C.A. Corporation: *See—*
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Valeron Corporation, The: *See—*
Hopkins, David Alan, 3,868,752.

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Kruskal, Vincent J., to International Business Machines Corp. Detection of possibly erroneous segments following failures in primary storage. T932,005, 3–4–75, Cl. 235—153.

McCullough, John F., and L. L. Frederick. Purification of wet-process phosphoric acid with methanol and ammonia. T932,002, 3–4–75, Cl. 423—321.

Null, George D.: *See*—
Bradley, Donald R., Null, and Takvorian. T932,007.

Satterfield, Richard A.: *See*—
Davis, Latham S., and Satterfield. T932,008.

Smithers, Michael B.: *See*—
Waples, George E., Jr., Smithers, and Heinemeyer. T932,-001.

Stingle, Hans A. Solubilized mono and disazo dyes. T932,006, 3–4–75, Cl. 260—163.

Strawser, Thomas J. Yarn break detector. T932,003, 3–4–75, Cl. 340—259.

Takvorian, Kenneth B.: *See*—
Bradley, Donald R., Null, and Takvorian. T932,007.

Waples, George E., Jr., M. B. Smithers, and B. W. Heinemeyer. Ethylene/ethylenically unsaturated carboxylic acid/unsaturated ester low molecular weight interpolymers useful as adhesives. T932,001, 3–4–75, Cl. 260—80.8.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF MARCH, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anna Welding Corp.: *See*—
Berghof, Ernest H. Re. 28,357.

Atlanta/La Salle Capital Corp.: *See*—
Sommeria, Marcel R. Re. 28,358.

Automated Packaging Systems, Inc.: *See*—
Lerner, Bernard. Re. 28,350.

Bell Telephone Laboratories, Inc.: *See*—
Hart, Harry P., and Kakalec. Re. 28,359.

Berghof, Ernest H., to Anna Welding Corp. Method and apparatus for underwater arc welding. Re. 28,357, 3–4–75, Cl. 219—72.

Bradley, John J.: *See*—
Nystrand, Ernst D., Bradley, and Spencer. Re. 28,353.

Buchholz, Harold J.: *See*—
Popoff, Ivan C., Buchholz, and Miller. Re. 28,356.

Dico Co., Inc.: *See*—
Larson, Robert W. Re. 28,352.

Dresser Industries, Inc.: *See*—
Dyer, Norman D. Re. 28,351.

Dyer, Norman D., to Dresser Industries, Inc. Pipe handling apparatus. Re. 28,351, 3–4–75, Cl. 173—164.

Evans, Paul F., H. D. Lees, and M. S. Maltz, to Xerox Corp. Electrophoretic color display device. Re. 28,360, 3–4–75, Cl. 358—56.

Hart, Harry P., and R. J. Kakalec, to Bell Telephone Laboratories, Inc. Closed loop ferroresonant regulator. Re. 28,359, 3–4–75, Cl. 323—56.

Kakalec, Robert J.: *See*—
Hart, Harry P., and Kakalec. Re. 28,359.

Kamatics Corp.: *See*—
Orkin, Stanley S. Re. 28,354.

Larson, Robert W., to Dico Co., Inc. Heel boom log grappling apparatus. Re. 28,352, 3–4–75, Cl. 214—147.

Lees, Harold D.: *See*—
Evans, Paul F., Lees, and Maltz. Re. 28,360.

Lerner, Bernard, to Automated Packaging Systems, Inc. Bag handling apparatus and method. Re. 28,350, 3–4–75, Cl. 53—29.

Lucas, Joseph (Industries) Ltd.: *See*—
Sommeria, Marcel R. Re. 28,358.

Maltz, Martin S.: *See*—
Evans, Paul F., Lees, and Maltz. Re. 28,360.

Miller, Harold J.: *See*—
Popoff, Ivan C., Buchholz, and Miller. Re. 28,356.

Nystrand, Ernst D., J. J. Bradley, and H. J. Spencer, to Paper Converting Machine Co., Inc. Web-winding apparatus and method. Re. 28,353, 3–4–75, Cl. 242—56.

Orkin, Stanley S., to Kamatics Corp. Bearing construction. Re. 28,354, 3–4–75, Cl. 308—238.

Paper Converting Machine Co., Inc.: *See*—
Nystrand, Ernst D., Bradley, and Spencer. Re. 28,353.

Pennwalt Corp.: *See*—
Popoff, Ivan C., Buchholz, and Miller. Re. 28,356.

Petri, Nello J. Means for securing an insert to a base piece. Re. 28,355, 3–4–75, Cl. 402—328.

Popoff, Ivan C., B. Buchholz, and H. J. Miller, to Pennwalt Corp. Antibacterial and antifungal treatment with sulfones. Re. 28,356, 3–4–75, Cl. 424—270.

Sommeria, Marcel R., to Atlanta/La Salle Capital Corp., and Joseph Lucas (Industries) Ltd. Linear and rotary magnetic motors. Re. 28,358, 3–4–75, Cl. 310—14.

Spencer, Harvey J.: *See*—
Nystrand, Ernst D., Bradley, and Spencer. Re. 28,353.

Xerox Corp.: *See*—
Evans, Paul F., Lees, and Maltz. Re. 28,360.

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American Standard Inc.: *See*—
Stairs, Henry M., Jr. 234,427.

Armour, John F., L. F. Plaskan, and P. L. Crease, to NCR Corp. Accounting machine or similar article. 234,430, 3–4–75, Cl. D26—5.

Bair, Lester E., to Fairshare Marketing & Mfg. Co., Inc. Cooking pouch. 234,417, 3–4–75, Cl. D9—249.

Becquet, Yvon, to Societe SO-GE-MA-P. Folding chair. 234,-414, 3–4–75, Cl. D6—73.

Boganowski, Theodore D., and T. L. Artificial Christmas tree. 234,432, 3–4–75, Cl. D29—1.

Boganowski, Theodore L.: *See*—
Boganowski, Theodore D., and T. L. 234,432.

Bombardier Ltd.: *See*—
Lapointe, Anselme, and Scott. 234,421.

Craik, Darrell W., to Teledyne Inc. Structural panel. 234,437, 3–4–75, Cl. D54—2.

Crease, Pierre L.: *See*—
Armour, John F., Plaskan, and Crease. 234,430.

Dashner, James W., to International Telephone and Telegraph Corp. Fire hydrant. 234,423, 3–4–75, Cl. D23—12.

De Filippis, John, and R. L. Taylor, to International Telephone Corp. Photoflash unit. 234,441, 3–4–75, Cl. D61—1.

Fairshare Marketing & Mfg. Co., Inc.: *See*—
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Hauner, Carlo. 234,413.

Fitzgerald, Timothy P., to Image Systems, Inc. Strip cutter. 234,438, 3–4–75, Cl. D55—1.

Forsey, Thomas, Jr., and D. D. Tompkins, to The Goodyear Tire & Rubber Co. Passenger vehicle body. 234,418, 3–4–75, Cl. D12—40.

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Gerdom, James M., to Honan Sales Co., Inc. Photoelectric eye unit. 234,426, 3–4–75, Cl. D26—1.
Golub, Abraham. Vehicle identification sign. 234,443, 3–4–75, Cl. D96—12.
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Iida, Yoshiaki, and K. Okabe, to Matsushita Electric Industrial Co., Ltd. Combined record player and amplifier. 234,439, 3–4–75, Cl. D56—4.
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Lapointe, Anselme, and T. Scott, to Bombardier Ltd. Watercraft. 234,421, 3–4–75, Cl. D12—69.
Lauderback, Stephen K., to Sunbeam Corp. Canister vacuum cleaner. 234,415, 3–4–75, Cl. D7—166.
Matsushita Electric Industrial Co., Ltd.: *See*—
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McGehee, Charles R., and B. H. Osterberg, to Western Data Products, Inc. Passenger turnstile. 234,431, 3–4–75, Cl. D28—1.
Micault, Andre: *See*—
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McGehee, Charles R., and Osterberg. 234,431.
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Plaskan, Laurance F.: *See*—
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Schock, Carlyle W. Motorized tree processing equipment vehicle. 234,420, 3–4–75, Cl. D12—57.
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Zuppert, Horace E., to White Consolidated Industries, Inc. Safety hat or similar article. 234,411, 3–4–75, Cl. D2—231.

CLASSIFICATION OF PATENTS

ISSUED MARCH 4, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

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15BS 3,869,080
3,869,579
18H 3,869,581

98 3,869,582
100.4ST 3,869,583
156 3,869,584
173 3,869,585

CLASS 180

9.24 3,869,011
9.5 3,869,010
11 3,869,012
44R 3,869,013
53R 3,869,014
71 3,869,015
73R 3,869,016
82R 3,869,017
89R 3,869,018
105E 3,869,019
120 3,869,020

CLASS 182

3 3,869,021
96 3,869,022

CLASS 184

15A 3,869,023

CLASS 188

72.5 3,869,024
79.5GE 3,869,025
79.5GT 3,869,026
340 3,869,027

CLASS 190

13R 3,869,034

CLASS 191

1R 3,869,028
49 3,869,029

CLASS 192

67R 3,869,030

CLASS 193

35R 3,869,031

CLASS 194

1N 3,869,032

CLASS 195

62 3,869,345
80R 3,869,346
3,869,347
99 3,869,348
103.5R 3,869,349

CLASS 197

10 3,869,033

CLASS 198

24 3,869,035
35 3,869,036
165 3,869,038
175 3,869,039
203 3,869,574
219 3,869,040
259 3,869,041
267 3,869,042

CLASS 200

11G 3,869,586
50AA 3,869,587
61.47 3,869,588
144B 3,869,589
157 3,869,590
321 3,869,591

CLASS 201

32 3,869,350

CLASS 202

172 3,869,351
227 3,869,352

CLASS 203

38 3,869,353
43 3,869,357

CLASS 204

1T 3,869,354
32R 3,869,355
38R 3,869,356
55Y 3,869,358
96 3,869,359
105M 3,869,360
148 3,869,361
157.1R 3,869,362
158R 3,869,363
180R 3,869,365
181 3,869,366
192 3,869,367
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195S 3,869,369
3,869,370
206 3,869,371
224M 3,869,373
224R 3,869,372
273 3,869,374
301 3,869,364
3,869,375
3,869,376

CLASS 206

45.31 3,869,043
63.3 3,869,044
229 3,869,062

CLASS 208

66 3,869,377
78 3,869,378

CLASS 209

222 3,869,379

CLASS 210

17 3,869,380
20 3,869,381
30 3,869,382
32 3,869,383
44 3,869,384
53 3,869,385
3,869,386
54 3,869,387
70 3,869,388
77 3,869,389
222 3,869,390
3,869,391
493 3,869,392

CLASS 211

11 3,869,045

CLASS 214

1BB 3,869,047
1R 3,869,046
8.5A 3,869,048
3,869,049
16R 3,869,050
18SC 3,869,051
38B 3,869,052
41 3,869,053
146R 3,869,054
147AS Re.28,352
151 3,869,055

CLASS 215

1C 3,869,056
216 3,869,057
219 3,869,058
320 3,869,059

CLASS 219

72 Re.28,357
73 3,869,592
121P 3,869,593
211 3,869,594
387 3,869,595
438 3,869,596
505 3,869,597

CLASS 220

19 3,869,060
270 3,869,063
334 3,869,061

CLASS 221

19 3,869,064
40 3,869,065
102 3,869,066

CLASS 222

70 3,869,067
148 3,869,068
180 3,869,069
193 3,869,070
385 3,869,071
402.16 3,869,072

CLASS 223

37 3,869,073

CLASS 224

1R 3,869,074
42.06 3,869,075

CLASS 229

16D 3,869,077
17R 3,869,078
32 3,869,076
40 3,869,079

CLASS 235

60TK 3,869,081
61.11E 3,869,599
61.11H 3,869,082
61.11R 3,869,598
61.12N 3,869,600
92PC 3,869,083
150.2 3,869,601
151.3 3,869,602
153AM 3,869,603
183 3,869,084
198 3,869,085

CLASS 238

10R 3,869,086

CLASS 239

128 3,869,087
177 3,869,088
338 3,869,089

CLASS 240

1.3 3,869,604
47 3,869,605
51.11R 3,869,606
52R 3,869,696

CLASS 241

5 3,869,090
183 3,869,091

CLASS 242

55.19A 3,869,092
55.21 3,869,093
55.53 3,869,094
56A Re.28,353
56R 3,869,095
84.8 3,869,096
107 3,869,097
107.4 3,869,098
199 3,869,099
201 3,869,100

CLASS 244

3.1 3,869,101
36 3,869,102
100R 3,869,103
110C 3,869,104

CLASS 248

188.8 3,869,105
345.1 3,869,106

CLASS 250

266 3,869,607
270 3,869,608
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303 3,869,610
311 3,869,611
319 3,869,612
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508 3,869,615
547 3,869,616

CLASS 251

94 3,869,107
366 3,869,108

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12.2 3,869,393
46.7 3,869,394
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527 3,869,412

CLASS 256

59 3,869,109

CLASS 259

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192 3,869,111

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6 3,869,414
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29.6P 3,869,465
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45.8NT 3,869,423
45.9R 3,869,424
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3,869,426
47EP 3,869,427
77.5AQ 3,869,428
78L 3,869,431
78S 3,869,429
3,869,430
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123.5 3,869,438
146D 3,869,439
146R 3,869,440
156 3,869,441
207.1 3,869,442
209R 3,869,443
210E 3,869,444
3,869,445
211.5R 3,869,446
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3,869,448
239.1 3,869,449
239.3T 3,869,450
239.5 3,869,451
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268PC 3,869,458
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268R 3,869,459
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307R 3,869,468
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326.12A 3,869,472
326.45 3,869,407
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343.7 3,869,474
345.2 3,869,475
3,869,476
345.5 3,869,477
346.2R 3,869,478
346.4 3,869,479
347.8 3,869,480
397.4 3,869,481
403 3,869,482
404.5 3,869,483
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429K 3,869,486
429.7 3,869,487
431.5C 3,869,488
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457 3,869,491
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465D 3,869,495
3,869,497
3,869,498
465E 3,869,496
465F 3,869,499
465G 3,869,494
465.3 3,869,500
3,869,501
468J 3,869,502
471C 3,869,503
3,869,504
479R 3,869,505
514.5 3,869,506
515A 3,869,507
531R 3,869,508
543R 3,869,509
544M 3,869,510
561N 3,869,511
571 3,869,512
577 3,869,513
584R 3,869,514
590 3,869,515
598 3,869,516
602 3,869,517
604R 3,869,518
614F 3,869,519
654D 3,869,520
667 3,869,521
3,869,522
668R 3,869,523
671M 3,869,524
873 3,869,525
929 3,869,526
946 3,869,527

CLASS 261

39A 3,869,528
130 3,869,529

CLASS 264

33 3,869,530
46.6 3,869,531
71 3,869,532
146 3,869,533
210R 3,869,534
219 3,869,535

CLASS 266

33S 3,869,112

CLASS 267

57.1R 3,869,113
69 3,869,114

CLASS 271

147 3,869,115
160 3,869,116
270 3,869,117

CLASS 272

3 3,869,118
38 3,869,119
65 3,869,120
79R 3,869,121

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94R 3,869,122
105.2 3,869,123
131AC 3,869,124
137D 3,869,125
175 3,869,126
195A 3,869,128
195B 3,869,127

CLASS 274

9B 3,869,129
10S 3,869,130

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27 3,869,133
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80 3,869,135

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11.35D 3,869,136
47.19 3,869,137
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3,869,142
150AB 3,869,143
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475 3,869,149

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114 3,869,151
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35 3,869,158
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108 3,869,160
166 3,869,161
283 3,869,162

CLASS 293

63 3,869,163
3,869,164
3,869,165
69R 3,869,166
71R 3,869,167

CLASS 296

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56 3,869,168

CLASS 297

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270 3,869,170
313 3,869,171
316 3,869,172
388 3,869,173

CLASS 301

9DN 3,869,174
37R 3,869,175

CLASS 303

3 3,869,176
21F 3,869,177
67 3,869,178

CLASS 307

88.3 3,869,618
117 3,869,619
141 3,869,620
147 3,869,621
213 3,869,622
241 3,869,623
267 3,869,624

CLASS 308

34 3,869,179
180 3,869,180
187.2 3,869,181
3,869,182
238 Re.28,354

CLASS 310

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152 3,869,626
162 3,869,627
179 3,869,628
216 3,869,629

CLASS 312

248 3,869,183
330 3,869,184

CLASS 313

188 3,869,630
217 3,869,631
325 3,869,633
330 3,869,634
3,869,635
341 3,869,636
346 3,869,632
500 3,869,637

CLASS 315

39.61 3,869,638
86 3,869,639
97 3,869,640
135 3,869,641
151 3,869,642
167 3,869,643
169TV 3,869,644
209T 3,869,645
246 3,869,646

CLASS 317

2B 3,869,647
16 3,869,648
18D 3,869,649
61 3,869,650
155.5 3,869,651
230 3,869,652

CLASS 318

364 3,869,653
443 3,869,654
591 3,869,655
696 3,869,656

CLASS 320

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CLASS 321

2 3,869,658
15 3,869,659

CLASS 323

17 3,869,660
20 3,869,661
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CLASS 324

34R 3,869,662
41 3,869,663
51 3,869,664
72 3,869,665
76R 3,869,666
113 3,869,667
133 3,869,668

CLASS 325

30 3,869,669
38A 3,869,670
118 3,869,671
392 3,869,672
393 3,869,673
422 3,869,674

CLASS 328

228 3,869,675

CLASS 329

204 3,869,676

CLASS 330

31 3,869,677
53 3,869,678

CLASS 331

8 3,869,679
94.5M 3,869,680
96 3,869,681

CLASS 332

11R 3,869,682

CLASS 333

30R 3,869,683

CLASS 335

152 3,869,684
196 3,869,685
216 3,869,686
236 3,869,687

CLASS 337

82 3,869,688
164 3,869,689
390 3,869,690

CLASS 338

231 3,869,691
296 3,869,692

CLASS 339

65 3,869,185
89R 3,869,186
91P 3,869,187
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98 3,869,190
111 3,869,191
147 3,869,192

CLASS 340

6R 3,869,693
16R 3,869,694
52A 3,869,695
146.3AG 3,869,698
146.3P 3,869,697
148 3,869,699
149A 3,869,700

CLASS 350

6 3,869,193
96WG 3,869,194
160LC 3,869,195
3,869,196
161 3,869,197
259 3,869,198
293 3,869,199

CLASS 351

85 3,869,200

CLASS 353

120 3,869,201

CLASS 355

3R 3,869,202
4 3,869,203
66 3,869,204
67 3,869,205

CLASS 356

2 3,869,206
4 3,869,207
102 3,869,208
103 3,869,209
106LR 3,869,210

161	3,869,211	10	3,869,709	**CLASS 403**		142	3,869,229	177	3,869,549	**CLASS 426**	
189	3,869,212	17	3,869,710	140	3,869,217		3,869,230	227	3,869,550	65	3,869,554
244	3,869,213		3,869,711	225	3,869,157	267	3,869,231	236	3,869,539	134	3,869,555
246	3,869,214	33	3,869,712	241	3,869,218	**CLASS 423**		270	Re.28,356	352	3,869,556
	3,869,215	35	3,869,713	282	3,869,219	7	3,869,536	301	3,869,551	393	3,869,557
CLASS 357		45	3,869,714	328	Re.28,355	121	3,869,537	306	3,869,552	443	3,869,558
54	3,869,704	48	3,869,715	**CLASS 415**		206	3,869,538	317	3,869,553	481	3,869,559
72	3,869,701	55	3,869,716	56	3,869,220	300	3,869,540				
74	3,869,702	60	3,869,717	130	3,869,221	390	3,869,543	**CLASS 425**		**CLASS 431**	
79	3,869,703		3,869,718	134	3,869,222	407	3,869,541	6	3,869,232	11	3,869,242
		72	3,869,719	**CLASS 417**		410	3,869,542	78	3,869,233	90	3,869,243
CLASS 358			3,869,720	212	3,869,223	544	3,869,257	112	3,869,234	116	3,869,244
5	3,869,705	77	3,869,721	383	3,869,224	645	3,869,544	113	3,869,235	326	3,869,245
12	3,869,706	92	3,869,722	430	3,869,225		3,869,545	144	3,869,236	351	3,869,246
56	Re.28,360	96	3,869,723	462	3,869,226	**CLASS 424**		292	3,869,237		
CLASS 360		106	3,869,724	**CLASS 418**		88	3,869,546	294	3,869,238	**CLASS 432**	
5	3,869,707	130	3,869,725	15	3,869,227	89	3,869,547	302B	3,869,239	80	3,869,247
8	3,869,708	**CLASS 401**		132	3,869,228	94	3,869,548	374	3,869,240	106	3,869,248
		43	3,869,216					405H	3,869,241	121	3,869,249

CLASSIFICATION OF DESIGNS

D2—	231	234,411		249	234,417	D23—	12	234,423		C	234,428	D34—	5CB	234,434	D56—	4R	234,439
	415	234,412	D10—	56	234,419		58	234,427			234,430		J	234,435			234,440
D6—	4	234,413	D12—	40	234,418	D24—	1B	234,424	D28—	1B	234,431	D39—	1R	234,436	D61—	1F	234,441
	73	234,414		57	234,420	D26—		234,425	D29—	A	234,432	D54—	2A	234,437		G	234,442
D7—	166	234,415		69	234,421		F	234,426		23	234,433	D55—	1	234,438	D96—	12R	234,443
D9—	54	234,416	D19—	91	234,422		5A	234,429									

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

53—	39	T932,006		37	T932,001	242—	68.3	T932,004	310—	178	T932,005	317—	15	T932,007	340—	172.5	T932,008
176—	36	T932,002	209—	166	T932,003												

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1	3,869,615		3,869,263		3,869,474		3,869,076		3,869,673		3,869,473
2	3,869,295		3,869,273		3,869,553		3,869,106	19	3,868,747		3,869,543
3	3,868,918		3,869,321		3,869,555		3,869,107		3,868,785		3,869,618
4	3,868,770		3,869,345		3,869,577		3,869,162		3,868,800		3,869,621
	3,868,828		3,869,351		3,869,583		3,869,169		3,868,843		3,869,638
	3,868,904		3,869,385		3,869,636		3,869,170		3,869,120		3,869,656
	3,869,085		3,869,386		3,869,708		3,869,172		3,869,148		3,869,662
	3,869,158		3,869,393	10	3,868,750		3,869,179		3,869,422		3,869,694
	3,869,704		3,869,421		3,869,067		3,869,237		3,869,641	26	3,868,730
5	3,869,521		3,869,438		3,869,339		3,869,249	20	3,869,168		3,868,732
6	Re 28,355		3,869,546		3,869,400		3,869,265		3,869,171		3,868,752
	3,868,733		3,869,556		3,869,416		3,869,274		3,869,497		3,868,766
	3,868,739		3,869,595		3,869,429		3,869,333	22	3,868,748		3,868,788
	3,868,742		3,869,613		3,869,430		3,869,348		3,868,760		3,868,796
	3,868,776		3,869,614		3,869,488		3,869,352		3,868,996		3,868,798
	3,868,787		3,869,625	12	Re 28,357		3,869,444		3,868,998		3,868,846
	3,868,789		3,869,631		3,868,731		3,869,445		3,869,294		3,868,864
	3,868,791		3,869,668		3,868,898		3,869,471		3,869,354		3,868,868
	3,868,797		3,869,676		3,868,944		3,869,481		3,869,483		3,868,886
	3,868,802		3,869,679		3,868,957		3,869,492		3,869,511		3,868,888
	3,868,804		3,869,680		3,869,068		3,869,508	24	3,868,891		3,868,889
	3,868,806		3,869,711		3,869,084		3,869,563		3,868,988		3,868,896
	3,868,823		3,869,713		3,869,278		3,869,582		3,869,083		3,868,923
	3,868,827		3,869,721		3,869,284		3,869,619		3,869,089		3,868,930
	3,868,834	8	3,868,727		3,869,580		3,869,639		3,869,132		3,868,934
	3,868,849		3,868,738		3,869,600		3,869,650		3,869,296		3,868,942
	3,868,863		3,868,799	13	3,868,795		3,869,712		3,869,297		3,868,945
	3,868,872		3,868,837		3,869,102		3,869,718		3,869,315		3,868,964
	3,868,880		3,868,878		3,869,110		3,869,719		3,869,576		3,868,986
	3,868,920		3,868,941		3,869,123		3,869,724		3,869,597		3,868,991
	3,868,921		3,868,997		3,869,484		3,869,725		3,869,648		3,869,001
	3,868,922		3,869,136		3,869,667	18	3,868,759		3,869,659		3,869,015
	3,868,943		3,869,256	17	Re 28,358		3,868,764		3,869,683		3,869,017
	3,868,949		3,869,257		3,868,735		3,868,765	25	3,868,741		3,869,019
	3,868,951		3,869,327		3,868,767		3,868,838		3,868,772		3,869,025
	3,868,958		3,869,559		3,868,790		3,868,866		3,868,792		3,869,038
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	3,869,012	9	Re 28,354		3,868,861		3,868,914		3,868,805		3,869,043
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	3,869,042		3,868,734		3,868,885		3,869,006		3,868,848		3,869,097
	3,869,069		3,868,830		3,868,906		3,869,027		3,868,857		3,869,098
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	3,869,119		3,869,066		3,869,018		3,869,272		3,869,195		3,869,144
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45 : 3,869,213
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49 : 3,868,825
51 : 3,868,778
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53 : 3,868,807
3,869,103
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54 : 3,869,502
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55 : Re.28,353
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12 : 234,443

17 : 234,415
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26 : 234,433

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6 : T932,008
8 : T932,004

10 : T932,006
36 : T932,007

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U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*